TWENTY-SECOND YEAR OF PUBLICATION

Industrial FINISHING

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By Lawrence H. Singer

Another Warning—Even the *Wall Street Journal* now raises its voice in forecasting that the consumer may soon be king again. In a provocative analysis of merchandising trends, this staid old financial organ envisions the end of our 5-year sellers' market in the not-too-distant future.

Although department stores from coast to coast continue to report dollar sales substantially above last year's record levels, this report contends that retail establishments are beginning to find their customers more choosey and less eager to buy. despite strikes and other reconversion problems, the *Wall Sreet Journal* insists that merchandise is becoming more plentiful, and that shoppers are holding off for what they want.

"Only fractions of yesterday's waiting lists are today's buyers," it warns. Here are two illustrations: A Portland Oregon merchant with 19 customers on his waiting list for refrigerators discovered that only three now want them. A New York department store advertised a big white-shirt sale—20,000 at $4.98; the expected tremendous response simply didn't materialize.

* * * *

Boom-Bust Pattern—In the sober estimation of Roscoe R. Rau, executive vice-president of the National Retail Furniture Association, the price-trend pattern in the home furnishing industry since V-J Day has followed "the identical pattern for the boom-bust period after World War I." On several occasions he has appealed to both manufacturers and retailers to hold the line on prices and not be stampeded into hysterical, unsound buying and selling. "The markets in Grand Rapids and Chicago," says Rau, "are a direct challenge to the home goods industries on the issue of whether free enterprise can control itself."

Rau implores retailers to buy on the basis of firm prices only, except under the most unusual circumstances. Furthermore, he asks merchants not to press manufacturers to accept orders for delivery next year, and not to gamble on inventories.

* * * *

Furniture Shortage—Another side of the problem facing furniture manufacturers is presented by W. A. Bryant, an executive of the Civilian Production Administration. Unless the Government wants its veterans and their families sleeping on floors, he insists, ways must be found to provide sufficient lumber to make more household furniture.

We are hoping to build 2,700,000 dwellings by 1948, Bryant continues, but it appears that a high percentage of these homes are destined to be without furniture for several years. This prophecy has been seconded by many leading furniture spokesmen, who state

that it won't do much good to build the houses if the occupants are unable to furnish them.

Here, in brief, is a picture of the grim lumber situation: In order to meet the house-furnishing schedules, over 4,500,000 board feet of hardwood lumber alone will be required. That is twice the amount of lumber used by the furniture industry in its peak prewar year—1941.

* * * *

Dust Remover—A new room-sized dust precipitator, engineered specifically for use in the average home, has been unveiled by the Raytheon Mfg. Co. of Waltham, Mass. This new device is designed to remove over 90% of dust, pollen, smoke and other airborne particles.

The Raytheon unit is housed in a metal cabinet that measures approximately 39x26x9-in., and is completely self-contained. The precipitator will be supplied in three stock finishes—grained mahogany, walnut and ivory. One of the noteworthy mechanical properties of this new appliance is a grill which may be cleaned by washing with a hot water spray without disturbing any electrical connections.

* * * *

Good Furnace Prospects—One industry which has not begun to worry about the end of a sellers' market is the home heating field. Observers declare that there are potential sales of at least 8,500,000 new units for the homes that will be built in the next few years.

Since the capacity of all heating manufacturers is only one million units annually, it is easy to understand the cheerful attitude of this industry. In addition to the new housing program, one authority estimates that there are at least 19 million private heating systems in

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this country which need replacement. The biggest headache facing heating manufacturers, besides the bottleneck in steel, seems to be the shortage of fractional horsepower motors.

* * * *

Outlook For Aluminum—A survey released by the University of Washington cites five major reasons for an optimistic outlook on the future of aluminum. These are: reduced price, increased supply, new alloys, familiarity of the product, and increased public acceptance.

It is forecast that the wartime process of electroplating aluminum will pave the way for its adoption in many types of automotive hardware. However, most experts do not feel that it will replace steel bodies or fenders in the foreseeable future.

* * * *

Business Risks—According to the National Association of Credit Men, less than 10% of former servicemen who plan to enter business for themselves possess the necessary qualifications. This organization fears that a marked increase in commercial failures is ahead.

Since the Association maintains offices in 122 cities, it is an unusual position to guage the outlook with accuracy. Many unqualified veterans are being urged to enter an apprenticeship period before taking the plunge into business with their own savings.

* * * *

High Auto Demand—When the automobile industry returned to peacetime operations a little over a year ago, it expected to turn out at least two million passenger vehicles in the first 12 months. The sad fact is, however, that less than

(Continued on page 106)

ENEMY OF DUST

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Survey of Methods for Cleaning Metal

Before any metal surfaces are painted, lacquered or finished they must be clean and dry. In this article the author tells something more about factory methods, materials and equipment employed for this work.

BY RICK MANSEL
Consulting Paint Chemist

THE SUCCESS of any finish coating on metal depends almost entirely on adequate surface preparation of the metal before it is painted. The best finish will often show poor performance characteristics if the metal over which it is applied was not properly treated or cleaned.

Since there are so many different types of surface preparation, it is necessary to consider a number of factors before an intelligent choice can be made as to which one to use. Among these factors are: 1) the kind of metal and its surface condition; 2) the presence of mild or excess rust or scale; 3) presence of soldering acids and fluxes, or slushing oil, grease or drawing compounds. Probably the amount of effort and expense given to surface preparation will always be influenced by the quality and cost of the finished article.

Experienced men know that finish coatings will not adhere satisfactorily to unclean metal. It is regrettable that so many harmful factors are not readily visible to the naked eye. For example, it would be helpful if we could see the harmful effect of grease and acids that are present in human perspiration, when traces of it remain on the metal after handling. Even an invisible film of moisture, attracted to the surface under certain conditions of humidity, may prove to be harmful at some time later in the life of the finish. Metal surfaces should be given their specified finish immediately after cleaning. Whenever metal cleaning includes the use of either alkaline or acid materials, all traces of the cleaner should be removed by thorough rinsing and drying. You have to give a thorough hot water rinse and adjust the overflow in the tank so that the water film will show no trace of the cleaner solution. When an article is removed from the rinse, the water film on the metal should be continuous over the entire surface. A break of the water film at any point indicates an unclean surface around that area. It may be an almost invisible film of oil, grease, wax or perspiration.

In former years the usual method of cleaning metal consisted

of wiping it with a clean rag, or perhaps washing it with naphtha or white gasoline. This sort of pretreatment was probably good enough for high-heat baking blacks, and even for certain types of air-drying materials which would stick to steel that was only fairly clean. Many of the old time paint jobs were put on with a brush. Brushing helped to displace some of the light film of dirt and grease; and it spread the paint over the clean metal. Now that practically all production jobs are sprayed, dipped, flow-coated or roller-coated, any foreign film on the metal surface remains there to cause trouble later.

When nitrocellulose lacquer coatings came into general use the necessity for thoroughly cleaning all metal surfaces became more apparent because these lacquer films would not only peel off in time but they would not dry on a greasy surface. Faster production schedules have brought a variety of cleaning problems.

Many Cleaning Methods and Materials Now Available

Manufacturers of cleaning materials have developed a wide variety of scientifically blended and balanced compounds and solutions which are exactly suited to cleaning metal in preparation for painting. These concerns should be consulted. They have a big fund of specific information at their disposal and they have highly experienced technical men whom they are always ready to place at your service.

Washing metal surfaces with solvents is the method commonly used where production is small or where conditions will not permit any investment in equipment. A common solvent used for this purpose is naphtha, but gasoline, lacquer thinner, toluol, xylol, carbon tetrachloride, and alcohol are sometimes used; also certain mixtures of these solvents are sometimes employed to take care of special conditions. Workmen simply wipe the metal with reasonably clean cloths wet with the solvent. This is followed by a careful wiping with clean dry cloths. Rust spots are removed by hand sanding, steelwooling or wire brushing.

Before they become too contaminated, the solvent and cloths must be either discarded or cleaned. Naturally there is a definite fire hazard connected with this type of cleaning.

Cleaning by baking in a "burn-off oven" will remove films of oil and grease to prepare the metal

A setup wherein metal parts in wire mesh baskets are moved through washing machine by a roller conveyor at work-table level. Photo courtesy of Metalwash Machinery Co.

for subsequent japanning or enameling. The heat in a burn-off oven will probably run 300° to 450° F. for two or three hours.

Alkaline Compounds and Their Characteristics

Next method to be considered is the use of alkaline compounds which exert a saponifying or emulsifying action on the oils or greases. Among the alkaline cleaning agents are sodium carbonate (sal soda or soda ash), caustic soda (soda lye), trisodium phosphate, sodium sesquicarbonate, sodium silicate, and sodium cyanide, as well as a variety of proprietary compounds which consist of a mixture of any two or more of the above, with added control materials.

Both sodium carbonate and caustic soda have been used successfully for cleaning iron and steel castings. They are very strong and require special handling care due to their corrosive action on the skin and clothes of workmen. Trisodium phosphate, sodium sesquicarbonate, and sodium silicate are not as strong alkalis and are therefore less corrosive in their action. Sodium cyanide, in combination with trisodium phosphate and soap chips, has given satisfactory service for cleaning copper and copper alloys. These alkaline cleaners are non-inflammable and, except for the sodium cyanide, are not poisonous. They are comparatively cheap but must be used while hot.

In plants where steam is available, alkaline cleaners can be used effectively and economically. They are generally used in open tanks or in specially designed washing machines in which the parts to be cleaned are sprayed. Washing is followed by a rinse in hot water, in which case the heat retained in the metal is sufficient for drying. Drying can be further accelerated by blowing a current of air over the cleaned surfaces.

Strength of Cleaning Solutions; Technique of Operations

The strength of cleaning solution required for any specified job will depend upon the compound used and the character of the parts to be cleaned. Generally a solution made by adding 6-oz. of compound to each gallon of water is sufficient. The solution will remain effective for some time, but will require an occasional addition of cleaner compound to maintain its strength.

Many different proprietary alkaline cleaners are on the market. Some of these, while strong enough to remove grease, oil and other foreign substances from surfaces, will not injure the skin of workmen—that is when reasonable precautions are taken. These compounds do not decompose with continued boiling. Three methods of cleaning come within this category, namely the *immersion process, the washing machine process and the electro-alkaline cleaning method.*

Immersion Process and Thorough Rinsing

In the immersion process the metal to be cleaned is dipped into or passed through a hot cleaning solution. Strength of the solution may be anywhere from 4-oz. to 8-oz. of concentrated cleaner to each gallon of water. Length of immersion may be from 5 to 15 minutes. This is usually determined by previous experiments.

Immersion in the cleaning solution is followed by a thorough rin-

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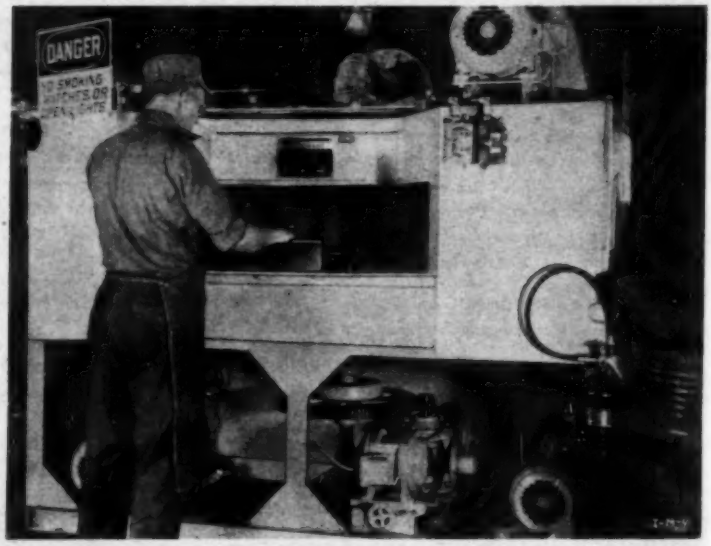
sing in clean water to remove all traces of cleaner compound from the metal. The rinsing tank is usually kept overflowing to remove the surface scum and to prevent any accumulation of alkali compound. It is generally kept hot so that the rinsed metal will dry quickly.

Special care is taken to control the alkaline strength of the cleaning solution. If it is too strong, then the rinsing will be just that much more difficult; if it is too weak, then the cleaning job will be either unsatisfactory or it will take too long. Rinse water must be kept clean; if it is allowed to become contaminated then all efforts at thorough cleaning are ruined. Alkaline control methods are usually made by titration. Some manufacturers of cleaning compounds supply special kits for this testing.

Specifications for Cleaning Steel are Numerous

It might be instructive now to apply these preceding principles to specific cases. Specifications for cleaning steel are numerous. Often sandblasting, wire brushing or similar mechanical means are indicated. Then there is the hot water solution of plater's cleaner or a metal cleaning compound in an electro-cleaning tank. The part or parts to be cleaned are hung from the cathode bar with a potential of from four to six volts across the bath. Again, heavily scaled parts are pickled in a warm (140° F.) 10% solution of mur-



A metal parts washing machine wherein the work is carried around by a turntable through washing, rinsing and drying zones. Photograph courtesy of Metalwash Machinery Co.

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iatic acid or sulfuric acid. After pickling, the part is dipped in a 2-oz. per gallon solution of soda ash or some other neutralizing agent, followed by a final rinse in hot water. Metal surfaces can also be "pickled" in an acid solution containing an inhibitor.

In this connection it is to be noted that when steel springs or other parts fabricated from steel wire are pickled, they should be baked at the end of the process for one hour at 300° F. Low carbon steels that have a heavy scale can be cleaned by acid pickling in a cold 35% sulfuric acid solution, or in a hot 10% solution of the same material. Low carbon steels that are only slightly scaled or coated with oxide can be treated with an electrolytic cleaner. The parts are treated as the cathode for about five minutes; then the current is reversed and they are treated as the anode for about half a minute.

Acid Solutions for Steel

High carbon steels can be cleaned with a 30% solution of nitric or hydrochloric acid. Corrosion resistant steels that have become scaled or rusted, due to some abnormal condition, are often cleaned at room temperature in a water solution of 25% nitric acid containing 2% hydrofluoric acid. They are treated until all of the scale is loosened and removed. The surfaces are then rinsed with water and all loose scale is removed by pressure spraying with water. Brushing the surface with a stiff fiber brush will remove any clinging scale. The metal is then passivated by immersion in a water solution of 50% nitric acid at room temperature for one or two hours. It is then thoroughly rinsed.

Cleaning Aluminum, Brass, Copper and Alloys

In the case of aluminum and its alloys, strong alkaline cleaners must be avoided, as they attack the metal. There are special cleaners supplied by manufacturers for use with aluminum. The parts are immersed in a hot dilute alkaline solution until all of the grease is removed. After rinsing with water the parts are immersed in a cold phosphoric acid solution or in a 5% chromic acid solution maintained at 130° F. This is followed by a final rinse in clean water.

Brass and copper alloys that are covered with scale or oxide are pickled in a cold solution composed of 50% sulfuric acid, 15% nitric acid, and ½% of hydrochloric acid; then follows a thorough rinsing.

One method of removing soldering acids from steel is to scrub the area with alkaline solution composed of equal parts of ammonia, alcohol and water. Welding and bronzing fluxes can be removed from steel by grinding with an abrasive wheel. For removing welding flux from aluminum, one method is to use a 10% solution of sulfuric acid followed by a thorough water rinse.

Selection of Equipment for Metal Cleaning Operations

Equipment employed for cleaning metal is largely determined by the rate of production desired, the nature of the metal parts to be cleaned, the kind and degree of dirt adhering to the parts, and the cleaning materials that are specified. Under normal conditions it is possible to purchase standard equipment for cleaning. In some cases it is desirable to set up

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In a continuous conveyor system the metal parts automatically move through the various sections of the machine to receive the required cleaning treatment. Drying and cooling equipment is often required to work in conjunction with washing machines. Hot air can be provided by an industrial air heater. In the stationary type of machine designed for parts that require simple washing, rinsing and pickling operations, the parts remain stationary in the machine while the rinses or cleaning solutions are blown over them. The size, shape and hardness of the metal parts will have some influence on the selection of machinery for cleaning. For instance, a different machine will be needed for cleaning sheet metal panels than is required for cleaning aluminum, brass or bronze castings.

Washing Machine Process; Electro-Alkaline Method

In the washing machine process a conveyor carries the items to be cleaned through chambers or tanks wherein some of the alkali cleaning solution is sprayed over the surfaces with considerable force, by means of circulating pumps. This spraying produces a form of mechanical scrubbing which assists the chemical action of the alkali cleaner to remove all dirt, oil or grease from the surface. The time for the entire cleaning and rinsing operation is generally about three to five minutes. The concentration of the cleaning solution is rarely more than 1-oz. of cleaner to each gallon of water.

The electro-alkaline method is not so often encountered but is efficient. It is similar to immersion alkali cleaning, except that an accelerated cleaning effect is produced by gas bubbles which are formed on the surface of the metal. These gas bubbles are induced by the passage of a direct current of electricity through the tank, using the work to be cleaned as an electrode.

Phosphoric Acid Type of Cleaner for Metal

Now let us consider the phosphoric acid type of cleaner. The material comes in concentrated form, in lead-lined drums or in glass carboys. Before use it is diluted with water, the amount of dilution depending on the condition of the metal to be treated. It is an excellent etching material and will cut its way through hardened metallic oxide surfaces. It is very penetrative and will go right down through a rust spot and into the pit holes. At the same time, due to its wetting properties, it will remove some of the grease contamination. It is ideal for use on galvanized iron or galvaneal.

The phosphoric acid cleaning solution can be applied manually. Of course the operator will need to wear rubber gloves and an apron. The surface of the metal is scrubbed with a stiff fiber brush dipped in reduced cleaner. If any traces of rust remain, these can be removed by rubbing with steelwool. Then follows rinsing in hot water and wiping with alcohol to remove any traces of moisture that may have entered metal seams. Any surface phosphate formed by the phosphoric acid attacking the metal is not harmful to paint coatings; in fact, the phosphate coating improves paint adhesion. *(Page 38)*

quality finishes

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Conveyorized setup includes dipping in hot cleaning solution, hot rinsing, etc.

Solvent Degreasing Methods; 1—Vapor Degreasing

Next comes the modern versions of solvent degreasing methods, utilizing solvents of the type of trichlorethylene which are non-inflammable. Machines used range from simple tanks to elaborate automatic outfits. They could be divided into three different types: 1) vapor degreasing; 2) the spray vapor degreasing, and 3) immersion vapor degreasing.

In the simple vapor degreasing method, hot trichlorethylene vapors condense on the cold metal which is moved into the vapor. This condensate dissolves any surface oil and grease on the metal and then drips back to the bottom of the tank where the heat causes the solvent vapor to rise, leaving the oil and grease to accumulate in the heating sump. Further condensation of the surface of the metal ceases when the metal becomes heated to about 190° F. Any loose dirt that remains on the surface of the degreased metal can be removed with a dry chamois or tack rag just before paint ing.

Cleaned metal parts and products should be painted as soon as the metal has cooled to room temperature, because the oil free metal surface will not resist rust very long.

Spray Vapor Degreasing Adds Pressure Spraying

In the second method, the vapor degreasing process is supplemented by a pressure spray of liquid solvent. The spraying action aids in removing dirt and any insoluble material which otherwise would have to be rubbed off.

In the third modification, the parts to be cleaned are dipped in

hot solvent and clean solvent rinses. Vapor cleaning is the final stage in each type of cleaning.

Chlorinated solvents used for degreasing have been made more stable against the formation of minerals acids when heated or diluted with moisture. This improvement is specially important when aluminum is being cleaned, since aluminum seems to promote decomposition of the cleaning solvent more rapidly than other metals. It causes the solvent to become what some workmen call "sour." A "sour" degreaser may be remedied by distilling the solvent and cleaning all of the apparatus with a mild neutralizer, and drying it thoroughly before using it again.

While on this subject of solvent cleaners it might be pointed out that one of the recent developments in this line is known as emulsifiable solvent cleaners. Various manufacturers have products which are diluted with hydro-carbon thinner. The thinner can be selected according to the degree of solvency and the rate of evaporation desired. Another type is a water-emulsion solution.

Solvent Vapor Odor Danger Signal

THE SENSE of smell can be a helpful safety aid in operations involving organic solvents. A strong odor of solvent in the workroom is a danger signal; it usually means a high concentration of solvent vapors in the air. Workers should be trained to report promptly a sudden rise in solvent odors, or a smarting of the eyes and nasal passages.

These are indications that something has "gone wrong;" excessive amounts of vapor are escaping. Breathing such amounts of solvent vapors may cause serious illness. Many organic solvents are flammable, so that a high concentration of vapor in the air may be a dangerous fire hazard.

Because organic solvent vapors may be both a health and fire hazard, solvent-using operations should be carefully controlled, so that the concentration of vapor in the atmosphere is kept to a minimum. Operations may be entirely enclosed, so that no vapor escapes; they may be provided with adequate ventilation, to remove vapors from the atmosphere; or, in certain instances, the worker may be equipped with approved respirators or gas masks.

It is not advisable, of course, to rely upon the sense of smell as a proof of safety. Odors may not be noticed by men accustomed to them; sometimes other odors may mask the solvent vapor; also, an atmosphere in which the solvent odor is only barely perceptible may still be unsafe. For these reasons, a periodic analysis of the workroom air, at the breathing level, by a competent chemist is desirable. For some solvents, there are continuous air sampling and recording devices which will help to ensure constantly safe atmospheres.—Safety Research Institute.

J. J. Mattiello Honored

Dr. Joseph J. Mattiello, Vice President and Technical Director of the Hilo Varnish Corp., Brooklyn, N. Y., has been elected honorary member of the Oil & Colour Chemist's Association of England, according to a cable recently received from the president of the organization, Dr. H. W. Keenan.

Flock

What flock finishing is, the variety of flock materials available, how it is processed and colored, how surfaces are prepared to take a coating of flock, what methods are used to apply flock, and why flock is so extensively used as a multi-purpose coating on so many different products.

WE CAN'T GET certain materials that we formerly used. Can we use flock as a substitute? This typical question, often asked during the war years, has opened the door for thousands of manufacturers to new uses for flock finishing.

"You have been using a substitute for flock," is the answer of enthusiastic flock advocates who emphatically state that, "Flock is not a substitute but a basic finish which, when properly applied to a product, adds certain desirable qualities not obtainable through any other kind of finish. In addition to its high decorative value, flock offers unlimited practical uses due to its durability, acoustical value, ease of application and adaptability."

It is impossible to speak dispassionately about flock finishing to a flock finisher or manufacturer of flocking materials. Their enthusiasm and exuberance over its limitless possibilities; their intense interest in the many new effects and uses becoming possible through the introduction of recently conceived materials and adhesives; and their wholehearted belief in their product excites a contagious

Finishes

BY ROSALIE FLANK

Three typical examples of attractive pattern flock coating within a border of straight flock finishing.

enthusiasm for more knowledge of this finish which, they claim, "is opening a new field in industrial finishing."

What Modern Flock is and How it is Processed

To understand and properly appraise flock finishing, it is necessary to know in some detail what it is, how it is applied, and how it can be used. A tour through a flock producing plant; visits with manufacturers of flocking machinery; supervised treks through flock finishing plants; and inspection of numerous products and installations where various types of flock have been used—collectively these serve, to some extent, to supply the answers.

To find an answer to the question, "What is flock?", let us go through the plant of a flock producing company in Rockford, Ill.* Our guide is Paul L. Flanigan, secretary and treasurer of the company and a pioneer in flock finishing. This particular company concentrates on the production of rayon and cotton flock. (Flock is also made of wool, silk and animal fibers.)

Rayon flock, dyed and treated for application, has the rich beauty of plush, velvet and velour. This type of flock is adapted to a wide variety of uses, as it dyes to a deep richness of color and will produce a great depth of pile, in addition to offering effective acoustical properties.

Cotton flock produces a coating that has the characteristic of suede. This finish is highly successful where a suede leather or felt effect is desired. It gives a cushion-like surface.

Wool gives a soft dull finish and is being used effectively in black for the interior of cameras, etc., where a deep non-reflecting black is needed. Because of the present price situation on wool, not a great deal has been done with wool flock. Animal fiber flock produces a surface suitable for carpets and floor mats.

Lengths and Colors of Flock for Finishing

Since uniformity of the pile fabric produced by flock finishing is of prime importance, before starting on a tour of the plant, one is impressed with the necessity of closely controlled lengths. Although the rayon filament for rayon flock can be cut to any length from .02-in. to .10-in. it has been found, through extensive research, that the most practical and effective lengths are 1/32-in., 1/16-in. and 1/8-in. In cotton flock the most practical lengths have been found to be 30, 40 and 60 mesh.

Bearing in mind the importance of controlled lengths, we first look at the cutting machines. Mounted on giant spindles, huge spinners of silvery white raw fiber (each skein consisting of 30,000 filaments) are unrolled, stretched and passed through a water bath. Three different types of fiber are being used—fine for short lengths, medium for medium lengths where a soft pile is desired, and heavy for long straight lengths.

From the water bath the fibers are directed through a series of rubber wringers and driven into the mouth of a cutting machine which bites off the fibers into the pre-determined, 1/32, 1/16 and

*Author's Note: Since I live in Chicago, I visited a concern not too far away—the Cellusuede Products, Inc. This firm supplied the samples of flock pictured on the preceding page of this article.

Enhanced by CLAREMONT FLOCK this Record Player is *Tops* in Sales Appeal!

Claremont Flocked Turntable Top Insures Non-Slip Surface
Claremont Flocked Base Provides a Decorative Complement to Assembly
Claremont Flocked Speaker-Grille Assures Clear Sweet Tones

The Claremont Waste Mfg. Co. is proud to call attention to the above Merry-Go-Sound* electric phonograph as a stimulating example of modern, attractive merchandising. Here the over-all use of Claremont Flock provided the *eye-appeal* that assures sure-fire *sales-appeal!*

Offering unlimited applications in the industrial field, Claremont welcomes the opportunity to serve you. Flock samples and full details furnished upon inquiry.

CREDIT

*Patents Pending — The above pictured record player is manufactured and flocked by the Tone Products Corporation of America, 331 Fourth Ave., New York 10, N. Y.

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NEW HAMPSHIRE
The Country's Largest Manufacturer of Flock

1/8-in. lengths. Constant tests, made under a microscope where a scale is mounted, keep an accurate check on these tiny particles.

The raw flock is next rushed to dye vats to be made into the colors which are standard with this manufacturer—green, canary, blue, maroon, black, brown, pink, gold, red, baby blue, white, silver, orange, grey, beige and medium yellow. However, the many barrels of specials which include chartruese, taupe, dusty pink, etc., indicate that colors dyed to order are also in great demand.

After the flock has been dyed and the dye is syphoned off, the flock is dug out of the vats and blown through large heated tubes into barrels where it is labeled as to type of fiber, length and color.

In the plant we see a testing laboratory where each batch of flock is tested on the various types of machines used for applying flock. These include spray guns, beater bars, and a Behr-Manning electrostatic machine. Surfaces on which flock coatings are tried include paper, various types of fabrics, metal, wood, plastics, etc.

Having seen the flock being made, we are now ready to learn how it is applied. Two operations are required in flocking: first the application of an adhesive to the surface to be coated, and then the application of the flock itself. We learn that while the most common application of flock is for an overall surface coating, it can be applied, with a high degree of accuracy, to selected areas in panels or spots, and in various patterns of complex design.

Since the adhesive is the base to which the flock must adhere, it must have certain qualities predetermined according to the use of the product. Obviously the durability of the flock coating will depend upon the quality of the adhesive.

While such adhesives as starch, animal glue and oxidizing oil (used in the silk screen method) are employed, the synthetic resins—alkyd, urea, vinyl, neoprene and phenol—are producing the types of adhesives that are giving flock its adaptability to such a wide variety of products. Due to the progress made in the use of synthetic resins during the war, great strides have been made in new adhesives; and some of the large paint companies today have flock adhesives designed to meet most specifications of flock finishers.

Prime quality of the adhesive used for flocking, according to manufacturers, is that it be very sticky (have good elasticity and tensile strength) and that it dry fast and hard. According to J. D. Bostrom, president of the Silk Screen Printing and Flocking Co. in Chicago (another pioneer in flock finishing), an adhesive used for flock must be flexible. It must have good color intensity and the aging of the rubber compound must be sufficient to retain the fiber anchorage throughout the life of the product, under normal service conditions. In the case of extremely porous surfaces, such as soft woods or fibrous surfaces, a sizing coat may be necessary before the adhesive is applied.

Suitable Adhesives Make Flock Coatings Washable

Adhesives which will allow a flock finish to be washable and dry-cleanable are now in production by some of the large paint companies. Dress goods and washable fabrics, upon which flock is

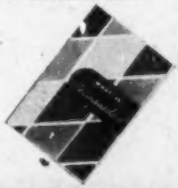
MANY USES IN RADIO FOR

Cellusuede FLOCK

1. Coating cabinet interiors dissipates reflections and adds acoustical qualities.
2. Coating the edges of adjoining parts before assembly eliminates vibration.
3. Coating wire grills adds a smart finish at low cost.
4. Coating phonograph turntables adds a soft non-scratching cushion for records.
5. Coating cabinet bases lends a soft velvety "feel" and protection to table and desk tops.

Both Cotton and Rayon Flock are available immediately in a variety of colors.

A trial application will show you how easily this versatile material may be handled . . . how practical it is for the above mentioned uses.



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CP *Cellusuede Products, Inc.*

ROCKFORD, ILLINOIS

used as decoration, must be able to withstand either reasonable laundering or dry cleaning and repeated pressing. As materials previously used exclusively by the armed services during the war are released, adhesives with qualities which will permit greater use of heavy animal fibers for rugs, etc., will appear on the market.

Both transparent and opaque pigmented adhesives are being used in flock finishing. Some finishers produce unusual effects by using an adhesive of one color and flock of another. Adhesives for use on white paper and fabrics must remain white and transparent. According to some of the finishers, a scarcity of certain materials makes this one of the problems, as there is a tendency of some transparent white adhesives to yellow when or after they dry.

In the pigmented adhesives, red presents the No.1 problem, as red pigment bulks and requires considerable thinning which tends to make the resin lose its adhesion. However, progress is being made and more and more reds are appearing on the market.

Application of Adhesive and Thickness of Coating

The type of adhesive and the degree of flexibility required depends upon the job. Experts advise that when ordering an adhesive it is best to specify the type of fabric, metal or material which is to be flock coated. Alkyd-resin-base adhesives are now widely used for metal, paper and general use. The vinyl-resin-base adhesives seem to qualify best for upholstery upon which flock is used, and the urea and neoprene types appear to be well suited to coat fabrics for shoes and materials of that nature.

Of utmost importance in the application of flock adhesive is uniform thickness of the adhesive coating. According to E. Medley, chief engineer of the Russell Electric Co., Chicago, where phonograph turntables are coated with flock on a production basis, repeated tests have proved that the adhesive must be applied to a thickness of .003-in. to .005-in. If the film of adhesive is put on too thick there will be runs and bubbles. If it is too skimpy, the flock finishing will be "spotty". Men who are experienced in this work declare that lack of knowledge in selecting and preparing suitable adhesives, and faulty application of the adhesives have been the main stumbling blocks.

By using an opaque pigmented adhesive of the same color as the flock, the operator can tell at a glance if the object is completely covered. This would be difficult with a transparent adhesive. Using the colored adhesive gives the finished surface greater density of color. Factory performance, according to Mr. Medley, has proved that a brown adhesive is an excellent base color for a wide variety of dark colored flock.

Methods of applying the adhesive vary according to the nature, design and size of the product. Adhesive material can be sprayed on with regular spray gun equipment. Spraying is especially adaptable for 3-dimensional objects or flat surfaces of small pieces in volume production. On large flat surfaces the adhesive may be applied by the silk screen process or by roller coating. The silk screen process is used for pattern work and "spot" flocking. This is especially adaptable for greeting cards, book covers, etc. For large runs of card-

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MOHAIR
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Perhaps the answer awaits you in RAYCO Flock

FUNCTIONAL USES

Used in the auto, airplane, radio, electrical, phonograph, ceramics, furniture and many other industries for surfacing all sorts of materials to provide—

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For so many hundreds of industrial and consumer product finishes, Rayco Flock is providing a quick, low cost answer. Many colors, various cuts of textile and hair fibres. Results when adhered to any surface are truly astonishing.

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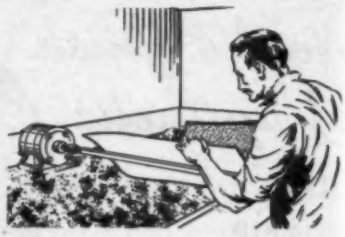
board or paper or other flat surfaces, a roller coating machine or glue spreader can be used.

How Flock is Applied to Adhesive Coated Surfaces

Just as the methods of applying liquid adhesive are varied, so are the methods of applying flock. Probably the simplest form of application includes the use of a revolving "beater bar." This is particularly adaptable where limited production demands a simple economical method of applying flock. Probably the most elaborate system is the electrostatic Behr-Manning process. Beween these two are the flock spray guns and automatic flocking machines. In all types of flock coating operations the object being coated must pass within a uniform distance of the flock in order that the flock will be uniformly distributed over the surface; and the flock must be kept clean and dry.

Let us first examine the beater bar method. As outlined by Mr. Flanigan, this includes a straight 1-in. bar, hexagon or octagon shaped in cross section and perhaps 3-ft. to 4-ft. in length. It is mounted in horizontal position and is arranged to rotate on its own axis in suitable stationary bearings. One end is connected to some suitable form of power drive. The whole unit is placed in a booth. This method is limited to coating something that will allow its under surface to be moved over and in contact with the rotating bar.

Flock is applied by scooping up a large quantity and spreading it over the top of the wet adhesive-covered surface. The underside of the object is placed directly over and against the rotating beater bar. To get complete coverage the operator sways the object, allowing it to be agitated by the rotating bar. The continued beating or vibrating makes the flock "dance" thus causing it to stand upright in the adhesive. This procedure takes but a few seconds per piece. When the object is completely coated the excess flock is shaken off by tapping the back of the flocked piece. All overflow drops to the bottom of the booth and is used again.



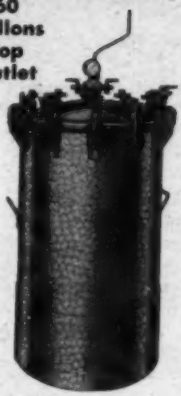
Using the single beater-bar method of coating a prepared surface with flock. Courtesy of Cellusuede Products, Inc.

From this simplest of all forms, we see the factory-built beater-bar type of equipment where a series of beater bars are installed in a rack over which a canvas belt travels. Flat work coated with adhesive travels along on this vibrating belt. Flock from a container above is sifted or blown onto the surface of the work. The operation takes place within a suitable chamber or tunnel and all surplus flock is recovered and used over again.

Spraying Flock With Hand Spray Guns

The flock spray gun is a popular method of application. Spray equipment is supplied by some of the leading makers of spraying equipment who produce booths

60 Gallons Top Outlet



30 Gallons Top Outlet

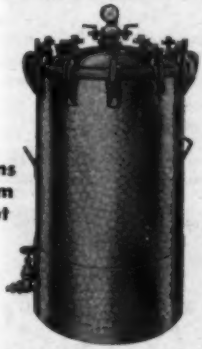
15 Gallons Top Outlet

2 Gallons Top Outlet

5 Gallons Top Outlet

10 Gallons Top Outlet

60 Gallons Bottom Outlet



30 Gallons Bottom Outlet

15 Gallons Bottom Outlet

2 Gallons Bottom Outlet

5 Gallons Bottom Outlet

10 Gallons Bottom Outlet

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and various sizes of equipment for spraying both the adhesive and the flock. Flock is usually sprayed at 40 to 60-lbs. pressure. In some setups the flock is fed into the spray gun from a hopper over which an infra-red lamp is mounted to keep the flock dry. Flock spraying calls for clean dry air. Compressed air lines must be well filtered to prevent oil and water from accumulating and reaching the spray gun. In some of the larger plants the flock is blown through heated ducts wherein a temperature of as high as 250° F. is maintained.

Since the presence of moisture is fatal to the successful application of flock, various methods have been developed to insure dryness, both when the flock is being used and when it is stored. Calcium chloride spread on shelves where flock is stored has been found to be quite helpful.

Use of Automatic Machines For Putting on Flock

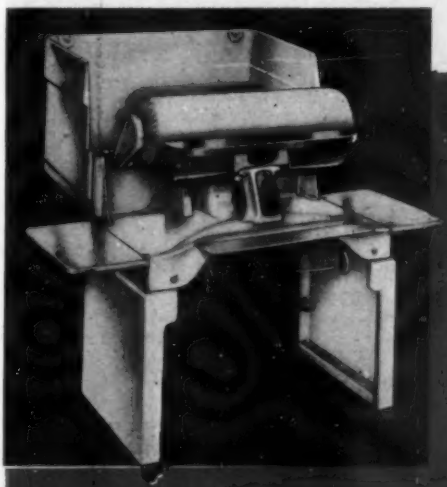
The more elaborate methods employed on large production jobs include the use of automatic flocking machines, using the air-coating principle; the flock is forced out through heated ducts. By use of automatic flocking machines, the coating thickness can be regulated and precision-made products can be air-coated to close tolerances.

Largest and most elaborate of all flock coating setups is the electrostatic process. Here one of two methods is used—either a pulsating or interrupted direct potential or an alternating potential. Under the influence of an alternating potential, the sign of the charge on the electrodes and on the particles is repeatedly reversed so that the particles bounce backward and forward between the electrodes. The outstanding feature of a pile fabric manufactured by the electrostatic process is the density of pile. As high as 275,000 fibers per square inch are obtained by this method.

After an article is flock-coated, the surplus flock is either beaten or blown off, the coated surface is dried either by passing it under or between infra-red lamps, or it may be air dried. After drying, a "seasoning" period is usually allowed by most finishers to assure the adhesive being completely cured.

According to statistics rayon flock covers 90-sq. ft. to the pound,

Part of an announcement printed on the suede-like surface of flock coated paper.



ENHANCE PRODUCT LEADERSHIP!

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Profit by the experience of the makers of the famous Ironrite ironer, quality leader in the ironer field for over a quarter century.

In this case, Berry Brothers' Technical Service came up again with important savings in time and handling . . . with a "two coat, one bake" system.

This popular Berry Brothers' *Postwar* White, largest selling white in Berry Brothers' history, combines many important qualities, including—

- **Exceptional whiteness**
- **Superior hiding**
- **Maximum chip-resistance**

Finishing system developed was—

- **Parts are placed on conveyor, travel to primer station where they are sprayed and air-dried 3 minutes while traveling to enamel booth.**
- **Then they are sprayed with one coat Infrabake White No. 107.**
- **Then 5 minutes through infrared unit.**

Write or call for further details, prices and samples.

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and cotton flock covers 100-sq.ft. to the pound. On a production basis, the application of flock, including the adhesive, flock and labor, averages approximately six cents per square foot. This is based on current cost and may, of course, fluctuate.

Variety of Surfaces and Products Can be Coated With Flock

Since any surface that will support a film of adhesive can be coated with flock, its uses are practically unlimited. It can be used successfully on metal, wood, glass, cardboard, paper, rubber, textiles, cast compositions and plastics.

Having been found to absorb sound waves up to as much as 60%, its use for sound proofing, coupled with its decorative appeal has made it practical for interior decoration—not only for automobiles but for airplanes, clubs, restaurants, cocktail lounges and even churches. Reports of homes being finished inside with flock are coming through from the east and west coast cities; and prefabricated homes with flock finished walls are hinted at as one of the products of the near future.

On the other hand, flock finishing has an effective acoustical use. Manufacturers of musical instruments are increasing the acoustical value of their products by covering the inside with a fine coating of flock. Helpful also in absorbing hum and sound interference, it is being used to coat the sound chambers of radios and phonographs and instrument panels. When used between joints in metal, it is an aid in preventing the development of squeaks.

By building up an area or an entire surface, flock can serve as a built-in "felt washer," as in cameras; or as an integral sealing medium similar to a gasket. Phono-

Coating flat work with flock on automatic machine. Photo, courtesy of Paasche Airbrush.

one-coat Fine Hammerloid

GLIDDEN'S new ONE-COAT FINE ("OCF") HAMMERLOID produces a hammered-type finish in *one coat* with ordinary spraying equipment. Colorful, beautifully and delicately textured, with character of its own, OCF HAMMERLOID adds sales punch to many an article at low cost. For complete information, write now to . . .

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GLIDDEN'S original HAMMERLOID with its larger pattern and greater possibilities of varying texture by spray gun adjustments, will continue to be the preferred hammered finish for certain kinds of work. It is also available in many attractive colors to meet varied requirements.

Pacemaker in Paints

graph turntables covered with flock are being widely used, since the flock coating provides a cushion as well as a retentive surface for the records.

Almost Unlimited Uses and Possibilities for Flock Coating

Since flock finished items can be fireproofed the use of flock has continued to increase. The use of flock for upholstering chairs (flock being sprayed directly over canvas); for finishing card tables; providing colorful and luxurious linings for drawers and trays in furniture, cedar chests, jewelry compartments, silver chests, instrument cases, tool chests, cases for athletic equipment, interiors of automobile glove and trunk compartments—all are popular.

Coating the underside of certain items to prevent wear on other surfaces is a common use. Telephone bases, letter trays, smoking trays, coasters, cigarette and jewelry boxes are examples. Spraying jewelry with flock to combat "allergy" to certain metals is already in vogue. Also, we can include mirror backs, album covers, book covers, picture frames, books for the blind, children's books, new finishes for toy animals, coverings for lamp shades, greeting cards, advertising portfolios, non-snagging clothes containers, etc.

Menu cards covered with flock may be printed, typed upon or mimeographed; and the art of print-flocked cloth has already achieved a high degree of perfection. Designs printed into curtains, dress goods and upholstery have given fabrics a new appeal. Crests and emblems on athletic goods and pennants, imitation suede shoes, belts, jackets and raincoats are all the outcome of the flocking process, wherein a common piece of burlap turns into "velvet" and ordinary canvas becomes a soft plush.

The flock coating becomes an integral part of the wood, metal, glass or plastic to which it is applied, and it cannot be scraped off. Radio manufacturers have found that a common mesh screen, when covered with flock, becomes a handsome panel for radio speakers; it will not stretch or sag, and it adds desirable acoustical qualities. Embroidery with flock is a recent development being used on table cloths, bedspreads, etc.

Novel and effective advertising and merchandising displays are also possible. Flock-covered backgrounds for stage and shop windows, which can be changed by new applications, are becoming increasingly popular. Many thousands of possibilities are offered by this finish which is expected to gain even more importance as new materials are released.

Schaefer Varnish Co. Men Are Promoted

The Schaefer Varnish Co., Louisville, Ky., announces the following changes within the organization, by which promotions and increased responsibilities are assumed by employees of long standing.

Mr. George W. Janssen, formerly plant superintendent, will represent the company in a sales capacity in the Chicago and adjoining territory. Mr. Hubert F. Donahew will become general plant superintendent in charge of production of all the company's products.

Mr. Janssen has been with the company since 1927, at which time he began work in the laboratory, and through his plant experience is highly qualified to serve customers of the company in their finishing and grinding liquid problems.

Mr. Donahew has been with the company since 1936, coming into the laboratory shortly after graduating from the Speed Scientific School with a degree in Chemical Engineering. After general laboratory and production experience he became superintendent of the enamel department in 1942.

A product is only as good as its finish . . . for when the surface goes, value goes with it. Automobile makers know that and have worked "hand in glove" with Stanley Chemists to constantly improve car finishes. So the answer is "yes" when it applies to automobiles — and the products of other major industries Stanley is proud to number among its customers. A problem presented to Stanley Chemists incurrs no obligation. Write the Stanley Chemical Company, East Berlin, Connecticut, makers of Stanley Lacquers, Enamels, Synthetics and Japans.

Stanley Chemical

Finishing

By H. B. CRAFT

Supervisor of Research and Quality Control Laboratory of the Mengel Co., Inc., Furniture Division, describes and illustrates the equipment, methods and materials required for conveyorized furniture finishing from the white to the final polish. This, the second of two articles, deals with an analysis of the finishing operations and schedules.

IF THE PRODUCTION of case goods could be confined to one class or type of furniture, then finishing on a conveyor line would be fairly simple. At present our line includes four suites, each of which requires different finishes, and this presents quite a problem. Flexibility of the conveyor system, plus the type of auxiliary equipment described in my previous article, combines to give us a practical answer to this problem.

Our research and quality control laboratory specifies the finishing materials, the application of these materials, and the schedules; and then our laboratory personnel checks the results. New materials and improved methods are always being tested in the laboratry and, based upon the results of these tests, various changes are made from time to time.

When case goods in the white come off the sanding line, all surfaces are "blown off," wiped and inspected. This is perhaps the most important work station in the entire system because, regardless of engineering and modern equipment, if the surfaces are not smooth, clean and free from defects, a satisfactory finish is impossible. Then we have four additional inspection stations: 1) after filler is padded and wiped; 2) between the first and second full lacquer coats; 3) after rubbing, and 4) final inspection prior to packing.

Operating at a conveyor speed of 14-ft. per minute it is highly necessary to retain a 2-hour bank of case goods at the loading point. Otherwise some empty carriers would often go through the system.

Back Staining, and Uniforming the Color

On all suites, back staining in booth No. 1 is the first operation. The color of this stain is chosen to match or harmonize with the color

Furniture by MODERN METHODS

of the particular finish specified for that suite. Next, a spray coat of tinted lacquer equalizer, or sap-stain, or non-grain-raising stain is applied. Which is used, depends upon the type of furniture being finished. Then the furniture passes through a drying oven. A cooling period is allowed as the goods travel outside, along the full length of this oven and up to the third floor.

Wash Coat; Filling; Padding in Filler, Oven Drying

On the third floor, in booth 3 (see Fig. 1) a lacquer ground coat or a tinted lacquer-base wash coat is sprayed on. After drying, scuff sanding is in order just ahead of booth 4 where the filler is sprayed.

Notice in Fig. 1 the area for wiping filler. Here a large padding machine, adjustably suspended overhead, is used to pad filler into the tops. A smaller padding machine is used on fronts and ends. Padding is followed by a coarse rag wiping and a final wipe-off with clean rags. After inspection, and repair if necessary, the furniture enters filler oven D.

One of Mengel's 18th Century mahogany-veneered "Permanized" bedroom suites.

Referring again to Fig. 1, the space adjoining the long sides of the ovens has double deck conveyors. It is in these areas (and under oven C which is at ceiling level) that freshly sprayed-on coatings are allowed to flow out and set, and where the furniture is allowed to cool after leaving the ovens.

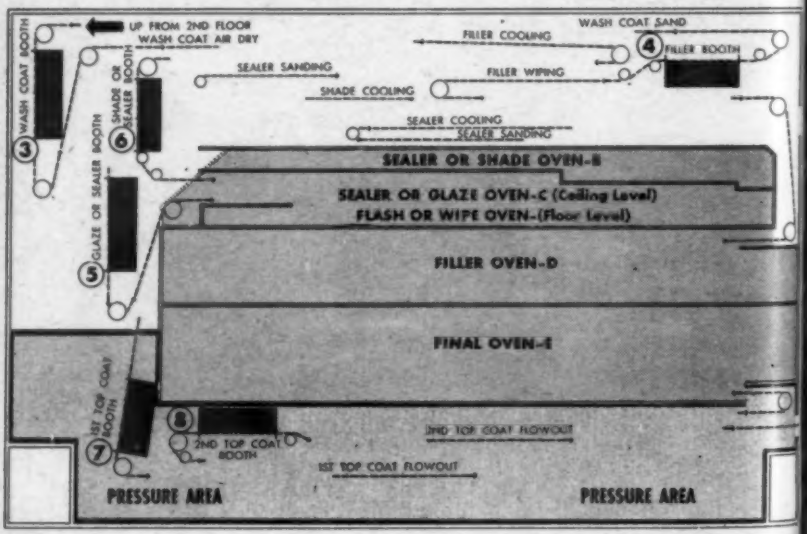
After the filler has been baked and the surfaces have cooled, the furniture enters booth 5 to receive a coat of lacquer sealer. Then, after traveling practically the entire length of oven C at floor level and at room temperature, the goods in process enter oven C. When the oven-dried surfaces are cool the sealer coat is sanded and cleaned. Then comes a spray coat of lacquer shading stain in booth 6. This is allowed to flow out before the goods enter drying oven B. Upon leaving oven B, the furniture has time to cool as it travels toward the pressurized area shown in Fig. 1.

Final Lacquer Coats Put on in Pressurized Area

The first coat of clear finishing lacquer is applied in booth 7. This coat is air dried outside the oven. The second coat of clear finishing lacquer is sprayed in booth 8. Then follows flow-out time, forced drying in oven E, and the usual cooling period.

At the extreme right in Fig. 1, and outside the pressurized area, goods are transferred to a horizontal slat conveyor which is only

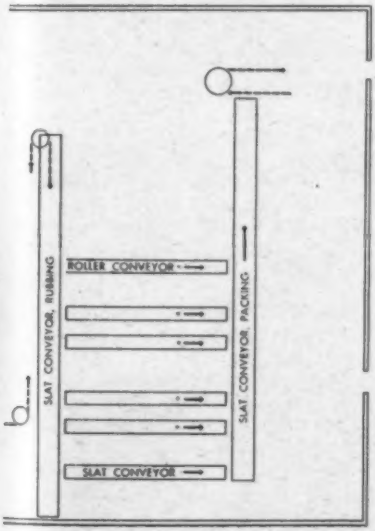
Fig. 1—Floor plan of principal portion of finishing room (on third floor) showing spray booths, work stations, ovens, and portions of the conveyor system which is on two levels, and which is so extensive that to show all of it on this one small drawing, with everything else, might be confusing to readers.



about knee high above the floor. Here is where the rubbing is done, as shown in Fig. 2. Five roller conveyors carry mirror frames, small chests, vanity benches, night tables and other small items to the packing conveyor. A single power-driven slat conveyor carries the larger pieces such as dressers, chests, vanities, etc., to the packing conveyor.

On these six cross-over conveyors the finished furniture is thoroughly cleaned after rubbing, polishing and inspecting. If any patching or touch-up work is needed it is taken care of here.

After final inspection the furniture is transferred to the packing conveyor. Packed cases are marked and transferred to an overhead chain conveyor which carries them either to the warehouse or to a loading dock.



Modern frosted oak "Permanized" dresser with straight front. Made by Mengel

Drawer interiors are given a spray coat of lacquer sealer in a small booth located on the assembly line. On the rubbing conveyor all drawer interiors are given a rag coat of tinted wax.

Power and Hand Rubbing; Cleaning; Waxing; Polishing

Every piece of furniture is rubbed all around, that is the top, front and ends. Power driven portable rubbing machines are used and the rubbing pads are covered with No. 360 wet-or-dry sandpaper which is soaked in oil prior to use. The lubricant for rubbing is mineral oil mixed with equal parts of naphtha. Next comes hand rubbing with burlap to "uniform" the job and then more hand rubbing with pumice (either white or colored) and rubbing compound. Newly rubbed surfaces are cleaned by wiping with dry waste. Moldings

and corners are carefully cleaned, and any surplus dry rubbing materials are blown off with an air gun. The final clean-up is with water to which is added a small quantity of "Duponol"; then follows wiping with dry waste.

The finished furniture is waxed with a uniforming wax. Those pieces that require a high polish are treated with polishing compound and then carefully power-buffed with clean pads. In buffing a lacquered surface, all traces of oil must be removed from the surfaces being buffed. The power driven buffs are moved slowly and kept flat with the surface so they will generate heat, thereby producing the desired polish.

Power-driven slat conveyor where the workmen do both machine rubbing and hand rubbing. Some of the rubbers ride the conveyor; others do their work as the piece moves along.

Typical Finishing Schedule on 18th Century Mahogany

Here is a typical finishing schedule on an 18th Century mahogany suite — including forced drying temperatures, relative humidity, and time, as well as cooling periods. Finishes on other suites are modified from this according to the kind of wood used and the type of finish desired.

1) Back Stain (water).
2) Equalizer (NGR stain).
3) Oven drying, 10 minutes at 115° F. and 35% relative humidity.
4) Air cool 20 minutes.
5) Wash coat (lacquer sealer 7% solids).
6) Air dry 25 minutes at 80° F. and 44% relative humidity.
7) Scuff sand with No. 360 wet-or-dry sandpaper; blow off and wipe.
8) Spray filler (10-lbs. paste to one gallon of naphtha; using 25-lbs. air pressure).
9) Pad, wipe and clean.
10) Oven dry about 1½-hours at 130° F. and 28% relative humidity.
11) Air cool 30 minutes.
12) Glaze sealer (lacquer base 4% to 5% solids).
13) Air dry 10 minutes.
14) Glaze. Oil-base pigmented (15 minutes to apply, wipe and blend).
15) Oven dry 43 minutes at 140° F. and 35% relative humidity.
16) Air cool 30 minutes.
17) Sealer (lacquer 16% solids). 10 minutes air dry to allow for flow out.
18) Oven dry 15 minutes at 115° F. and 35% relative humidity. *(Cont'd page 66)*

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Section of packing conveyor, showing packing station. Note spools of steel strapping suspended conveniently over work station. The strapping uncoils only when used.

19) Air cool 20 minutes.
20) Scuff sand with No. 360 wet-or-dry sandpaper; blow off and wipe.
21) Coat with 27% solids lacquer.
22) Air dry 25 minutes (room temperature 75° to 80° F.).
23) Second coat of 27% solids lacquer.
24) Flow out 25 minutes (room temperature 75° to 80° F.).
25) Oven dry almost 2 hours at 120° F. and 35% relative humidity.
26) Air cool 1¼ hours.
27) Rub and clean up.

To attain uniformity in the appearance of a frosted oak suite, the wood in the white must be carefully selected for color—that is the wood to be used for tops, fronts and ends. This applies especially to all oak used in any one piece, and includes both solid wood and plywood. Next, all streaks and discolorations must be removed.

As far as the finishing procedure is concerned, it is practically the same as for the mahogany suite, except that a thinned white enamel is used on backs, and a white titanium base filler is used on the face wood. White pumice is used for rubbing instead of rottenstone and colored compound, followed by a through cleaning. Too much emphasis can not be placed on cleaning after rubbing, if a good clear finish is to be obtained.

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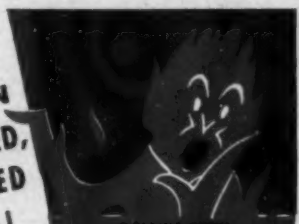

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Paint Testing

BY G. C. CLOSE

THE PAINT used on the concrete floors of the various atomic bomb plants had to undergo grueling tests before it received the government stamp of approval. It had to withstand not only frequent harsh scrubbings to remove every trace of radioactive substances that might endanger the life of the workers, but it also had to withstand numerous chemicals as well.

The photograph shows apparatus developed by the American Pipe and Construction Co., Los Angeles, producers of the paint, for conducting numerous chemical resistance tests at one time. Test panels coated with the paint are enclosed in each jar, along with some chemical solution. Dehydrated compressed air is fed into the jar in sufficient force to agitate the solution violently, causing it to splash continuously over the surface of the sample. Just behind each jar, infrared lights burn intermittently, submitting the sample to radical changes in temperature. It is hard to imagine a more grueling test for a surface protective coating.

The paint finally selected was a vinyl-resin composition, offering the ultimate in chemical resistance, abrasion resistance, and with sealing property that would effectively close the pores in the concrete floors. This paint was developed originally as a sealant for concrete structures in contact with moisture and corrosive liquids.

Special apparatus developed and used for making tests on painted panels.

Analysis of Cost Cuts in a Finishing System

BY H. E. VAN SICLEN
Western Electric Co.

Do these results interest you?

Sanding time reduced 38%

Finishing labor,.....25%

Finishing materials,....30%

Finishing interval,.....20%

IN THE APPLICATION of wood finishes, operations are often based upon methods handed down through the years. Although these methods usually produce satisfactory finishes, they are often costly and require long manufacturing intervals. An investigation of a varnish finish on cabinets is described here to illustrate some of the economies that can be effected by careful study of the individual operations and methods.

The finish under investigation consisted of a 3-coat rubbed varnish finish on mahogany, applied over a combination filler and stain and a water toner. Both the plywood and solid wood parts used in the construction of the cabinets were fabricated, assembled, and sanded equivalent to that obtained with 3/0 paper prior to finishing.

The water toner was applied over the filler to provide the uniformity of color desired. The finish required on these cabinets was a smooth, even textured surface of very high quality, and it was originally believed necessary to follow the procedure listed here to obtain a satisfactory product.

1) Fill and stain; air dry overnight.
2) Tone; air dry one hour.
3) Spray 1st coat of varnish; force dry 5 to 7 hours at 110° F.
4) Sand with No. 5/0 paper.
5) Spray 2nd coat of varnish; force dry 5 to 7 hours at 110° F.
6) Sand with No. 5/0 paper.
7) Spray 3rd coat of varnish; force dry 5 to 7 hours at 110° F.
8) Sand with No. 6/0 paper.
9) Steel wool "00".
10) Rub with pumice (0 to ½) and oil.
11) Touch up.

It was apparent that sanding represented a high percentage of the finish costs. Engineering efforts were therefore concentrated on methods of reducing sanding time by cutting out operations and reducing the time spent on those operations that could not be eliminated.

Mahogany Veneered Panels Were Used in Tests

In the experimental work, commercial mahogany-faced ¼-in. plywood panels 15x36-in. were used as test panels. These were belt sanded with No. 3/0 abrasive before finishing. No standards of sanding quality were available and it was found necessary to provide observational standards for

SANDING RESULTS Grades 1, 2, 3 and 4 on First Coat of Varnish (No. 5/0 sandpaper.)	SANDING RESULTS Grades 1, 2, 3 and 4 on Second Coat of Varnish (No. 5/0 sandpaper.)	SANDING RESULTS Grades 1, 2, 3 and 4 on Third Coat of Varnish (No. 6/0 sandpaper.)
First Coat of Varnish Varnish coat was sprayed over filled, stained and toned mahogany plywood, showing normal pin holes and dust spots on surface.	**Second Coat of Varnish** Varnish applied over Grade #3 sanding on 1st coat; see column No. 1 at left under "Grade #3 Sanding."	**Third Coat of Varnish** Varnish applied over Grade #3 sanding on 2nd coat; see column No. 2 at left under "Grade #3 Sanding."
Grade #1 Sanding Unsatisfactory sanding. Surface dust specks still show; numerous varnished areas are not sanded.	**Grade #1 Sanding** Unsatisfactory sanding. Streaks and white spots show varnished areas.	**Grade #1 Sanding** Unsatisfactory. Uneven and streaky sanding. Numerous varnished areas show sanding incomplete.
Grade #2 Sanding Slightly better than #1. Dust specks practically gone. Streaks and white spots show unsanded areas. Recommended for 3-coat finishing system.	**Grade #2 Sanding** Surfaces are sanded more uniformly than Grade #1. Unsanded varnished areas are prominent, but smaller.	**Grade #2 Sanding** Surfaces are sanded better and more uniformly than Grade #1. The unsanded varnished areas are almost entirely eliminated.
Grade #3 Sanding Recommended for 2-coat finish system. Normal surface irregularities almost entirely removed.	**Grade #3 Sanding** Recommended for 3-coat system. Surface uniformly sanded. Dust spots and the normal surface irregularities removed.	**Grade #3 Sanding** Recommended for 3-coat system. All normal surface irregularities are removed. Satisfactory for steel-wool operation.
Grade #4 Sanding Surface is well sanded. Requires an experienced sander to avoid cutting through. White areas (on photographs) show unsanded varnish in pores.	**Grade #4 Sanding** Surface sanded perfectly smooth. No unsanded varnish in evidence. Can be done by the average operator without cutting through—in view of the additional coat of varnish.	**Grade #4 Sanding** Surface sanded perfectly smooth and all imperfections are removed. Can be done by average operator without cutting through, because of the additional coats of varnish.

Fig. 1—In the grades of sanding referred to here and elsewhere in this article, Grade No. 4 is the best—most thorough, and most desirable—while Grade No. 1 is the least desirable. Grades No. 3 and No. 2 are intermediate in the order shown.

use in preparing the test panels. This was done by preparing panels with one, two and three coats of varnish to show various levels of sanded quality.

Four quality levels of sanding were considered adequate for each coat. Grade No. 1 represented poor, light sanding; No. 2 and No. 3 were the intermediate grades and No. 4 was the best quality commercially available. The standard panels representing two and three coats of varnish were sanded equivalent to Grade No. 3 between coats. These standards were illus-

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OPERATION PERFORMED	TEST PANELS								
	A	B	C	D	E	F	G	H	I
Fill and Stain	x	x	x	x	x	x	x	x	x
Tone	x	x	x	x	x	x	x	x	x
Spray 1st coat of varnish	x	x	x	x	x	x	x	x	x
Sand (No. 5/0 paper) Grade No.	3	3	2	3	1	3	3	3	2
Spray 2nd coat of varnish	x	x	x	x	x	x	x	x	x
Sand (No. 5/0 paper) Grade No.	3	3	3	4	2	–	–	–	3
Sand (No. 6/0 paper) Grade No.	–	–	–	–	–	4	4	3	–
Spray 3rd coat of varnish	x	x	x	x	x	–	x	–	x
Sand (No. 6/0 paper) Grade No.	4	3	4	4	4	–	–	–	3
Steelwool ("00")	x	x	x	x	x	x	x	x	x
Rub Pumice and Oil	x	x	x	x	x	x	x	x	x

Fig. 2—Schedule of finishing systems tested (on panels A to I inclusive) along with grade of sanding used (as outlined in Fig. 1). Note: Each operation performed, other than those showing grade of sanding, is designated by the letter "X."

trated by photographs showing the appearance of panels subjected to four different grades of sanding following the first, second and third coats of varnish. These pictures would not show clearly enough here to reveal the fine points of difference, so I will give the results in tabular form—see Fig. 1.

Upon completion of the sanding standards, various experimental finishing systems were developed. The operations involved in the nine systems tested are shown in table 2. All samples were prepared by the regular operating personnel of the wood-finishing shop. Many worthwhile ideas were contributed by the operators; naturally, their

OPERATION PERFORMED	2-COAT SYSTEM (Approved)		3-COAT SYSTEM (Approved)		3-COAT SYSTEM (Original)	
	Sanding Grade*	Time in Minutes	Sanding Grade*	Time in Minutes	Sanding Grade*	Time in Minutes
Fill and Stain		2.06		2.06		2.06
Tone		.51		.51		.51
Spray 1st coat of varnish		.22		.22		.22
Sand (No. 5/0 paper)	#3	2.25	#2	1.17	#1	.90
Spray 2nd coat of varnish		.50		.50		.50
Sand (No. 5/0 or 6/0 paper)	#3	1.57	#3	1.03	#2	1.17
Spray 3rd coat of varnish		—		.50		.50
Sand (No. 6/0 paper)		—	#3	1.57	#4	4.08
Steelwool ("00")		1.09		1.12		1.29
Rub pumice and oil		1.86		1.70		1.70
Extra Handling Time**		—		.32		.32
Total Time		10.06		10.70		13.25

Fig. 3—Comparison of operating time for 2-coat and 3-coat varnish systems, based on mahogany faced ¼x15x36-in. plywood panels.

*See Fig. 1 for explanation of different grades of sanding.

**This is additional handling time that would be needed (from rack to spray booth or bench and back) by use of a 3-coat system over that of a 2-coat system.

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cooperation in a program of this type is essential for good results.

Completion of the tests showed that panels representing several of the finishing systems tested were comparable in quality to the original finish. With available time-study data on the various operations, it was possible to select the most economical finishing systems that would produce a finish equal in quality to the original high-cost finish.

Table No. 3 gives the operating time of the two best methods developed, and that of the original

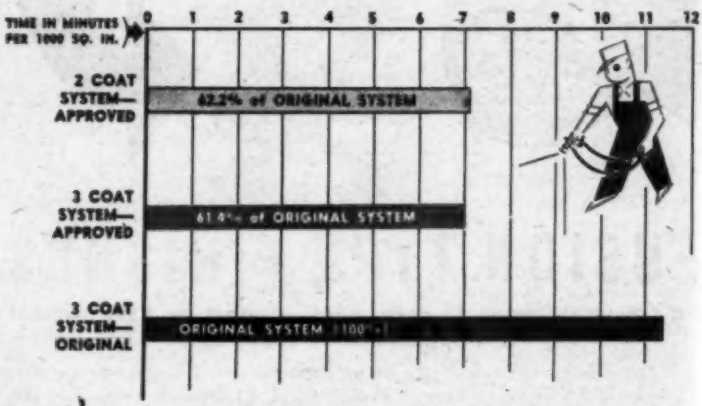
TIME IN MINUTES PER 1000 SQ. IN.
0 1 2 3 4 5 6 7 8 9 10 11 12
2 COAT SYSTEM—APPROVED
62.2% of ORIGINAL SYSTEM
3 COAT SYSTEM—APPROVED
61.4% of ORIGINAL SYSTEM
3 COAT SYSTEM—ORIGINAL
ORIGINAL SYSTEM (100%)

Fig. 4—This chart shows the total sanding time required for each of the three systems.

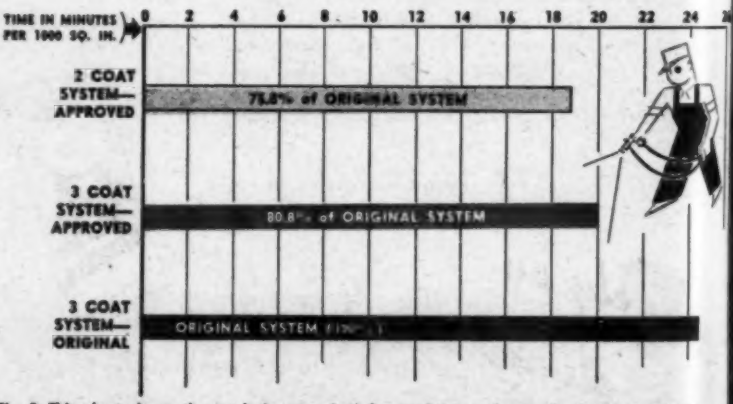
TIME IN MINUTES PER 1000 SQ. IN.
0 2 4 6 8 10 12 14 16 18 20 22 24
2 COAT SYSTEM—APPROVED
75.8% of ORIGINAL SYSTEM
3 COAT SYSTEM—APPROVED
80.8% of ORIGINAL SYSTEM
3 COAT SYSTEM—ORIGINAL
ORIGINAL SYSTEM (100%)

Fig 5—This chart shows the total time required for applying each specific finishing system.

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3-coat finish. Comparison of the new and old systems is shown graphically by the charts marked Fig. 4 and Fig. 5. These charts show the total sanding and total finishing time for each finishing system, as aplied to 1000-sq.in. of surface area. *(Cont'd on page 84)*

2-Coat System, Approved	3-Coat System, Approved	3-Coat System, Original
First coat of varnish sprayed over filled, stained and toned mahogany plywood. Small pin holes and dust spots are noticeable.	First coat of varnish sprayed over filled, stained and toned mahogany plywood. Small pin holes and dust spots are noticeable.	First coat of varnish sprayed over filled, stained and toned mahogany plywood. Small pin holes and dust spots are noticeable.
First coat sanded; Grade #3 sanding (Fig. 1, column 1) using No. 5/0. Surface irregularities considerably reduced.	First coat sanded; Grade #2 sanding (Fig. 1, column 1) using No. 5/0. Fair amount of varnished surface unsanded.	First coat sanded; Grade #1 sanding (Fig. 1, column 1) using No. 5/0. Unsatisfactory. Shows many areas not sanded.
Second coat of varnish sprayed. Shows a comparatively smooth surface. Flowing properties of the varnish help to eliminate the depressed areas and pin holes.	Second coat of varnish, sprayed. Depressed areas and pin holes reduced.	Second coat of varnish sprayed. Shows depressed areas and pin holes slightly reduced.
Second coat sanded; Grade #3 sanding, using No. 6/0 sandpaper, see Fig. 1, column 3. All normal surface irregularities removed.	Second coat sanded; Grade #3 sanding, using No. 5/0 sandpaper, see Fig. 1, column 2. Surface well sanded and fairly uniform.	Second coat sanded; Grade #2 sanding, using No. 5/0 sandpaper, see Fig. 1, column 2. Unsanded varnished areas still prominent but smaller.
Steelwool: Rubbed with "00" steelwool. Shows a smooth surface and no trace of uneven sanding marks and scratches.	Third coat of varnish sprayed. Surface exceptionally smooth. Shows results of good sanding on previous coat and ability of varnish to level off perfectly.	Third coat of varnish sprayed. Surface appears smoother, resulting from the varnish building up and leveling off.
Surface is rubbed, using No. 0 or No. ½ pumice and light mineral oil. It gives a uniform surface free from defects, and it is of the proper gloss.	Third coat sanded; Grade #3 sanding, using No. 6/0 sandpaper, see Fig. 1, column 3. Surface is sanded uniformly and all irregularities are removed.	Third coat sanded; Grade #4 sanding, using No. 6/0 sandpaper to overcome insufficient sanding of first and second coats. (See Fig. 1, column 3.)
	Steelwool: Rubbed with No. "00" steelwool. Shows a smooth surface and no trace of uneven sanding marks.	Steelwool: Rubbed with No. "00" steel wool. Shows a smooth surface. No trace of uneven sanding marks.
	Rubbed with No. 0 or ½ pumice and light mineral oil. Gives a uniform surface free from defects and of the proper gloss.	Rubbed with No. 0 or ½ pumice and light mineral oil. Gives a uniform surface free from defects and of the proper gloss

Fig. 6—Here are the step by step operations of the three finishing systems.

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The sanding time required for the 2-coat system is equivalent to that of the improved 3-coat system because a better grade of sanding was applied to the first coat of varnish in the 2-coat system, to insure a satisfactory surface for the final coat. The table marked Fig. 6 shows the step by step operations of the 2-coat, 3-coat improved, and 3-coat original finishing systems.

The results indicated that total sanding time required for applying the finish could be reduced and that the 2-coat rubbed varnish finish could be substituted to increase savings and still maintain quality. The actual results obtained by the 2-coat system were as follows:

1) Elimination of 38% of the original sanding time.
2) Finishing labor reduced 25%.
3) Cost of finishing materials reduced 30%.
4) Finish interval reduced 20%
5) A 2-coat rubbed varnish finish is comparable in appearance and quality to the 3-coat finish.

These results are indicative of the economies that can be realized by a careful engineering survey of finishing practices and methods. While the original 3-coat system was somewhat antiquated and offered a more fruitful field for cost reduction than more modern lacquer and varnish systems, the basic approach to the finishing problem described in this article will pay big dividends in reduced costs and improved quality on many product finishing jobs today.

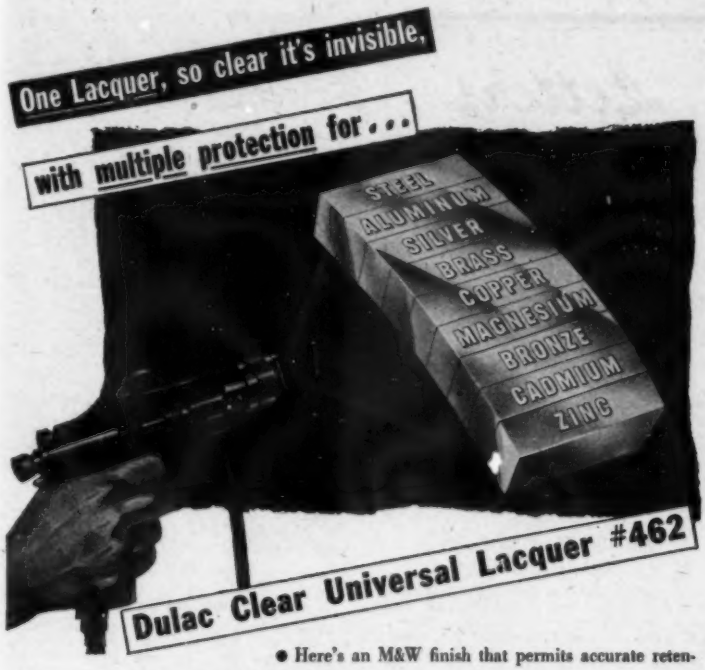
Classic Black & Gold Decorative Finish

CLIMAXING SEVERAL years of research, Elgin American, Elgin, Ill., highlighted the August opening of its new office in the Empire State Building in New York with the showing of a new line of compacts demonstrating the company's exclusive "Classic Black and Gold" finish.

The new decorative technique representing the first Elgin American post-war development in finish and decorating, introduces a process for finishing metal in jet black combined with gold plating. The Elgin American laboratory spent several years in developing for modern production methods the process originally developed in China centuries ago as "kara-kane" or literally "Chinese metal."

The line has created widespread comment and received a spectacular reception. "The most beautiful treatment of compacts I've ever seen," enthused an outstanding jewelry authority and member of the jewelry industry publicity board. "The depth of color, the startling blackness of the hue, and the clever combination with gold destine these items as best sellers." This authority also predicted the application of the treatment to cigarette cases, dresser sets, and other jewelry items.

The finish is claimed to excel enamel and cloisonne, not only in beauty but in durability as well. Since the color is actually impregnated in the metal itself, and is not a separate surface like enamel, the compact can be severely bent and damaged without chipping or affecting the color. Excessive heat and handling will not harm the finish.



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Letters from Readers

Roller Coater for Painting Venetian Blind Slats

One of our customers is in the market for a roller coating machine suitable for use on venetian blinds. May we have the names of some manufacturers of this equipment?—W. Co.

Try Gasway Corp., 6468 N. Ravenswood, Chicago, Ill.—Ed.

Metallic Paint to Carry Electric Current

I am interested in learning the source of some kind of a metallic paint that can be applied by the silk screen process, and which will conduct electric current (6 volts) when the paint is dry.—H. H.

Who can supply this?—Ed.

Tack Rags Wanted

Will you kindly furnish us with names and addresses of manufacturers of tack rags for use in finishing, as per the article on page 56, the July issue?—M. P. Co.

In that same issue, as well as in June and August issues, two firms offer tack rags in ¼-page display advertisements.—Ed.

Crackle Finish

From time to time I have had the opportunity to read "Industrial Finishing," and while I am not a manufacturer, I have a hobby of refinishing old furniture and antiques.

I have been trying to find a company that manufactures a finish which I have seen applied to furniture, and which, I believe, is called a "Crack-a-Lac" finish. I understand it is a 2-coat process, the top coat drying faster so that the undercoat produces a cracked finish similar to an "alligator hide." That is what I would like to locate.

Of course, I would not be a large buyer, but first wish to do some experimenting. Can you give me the name of any manufacturer who is now making the product?—V. E.

Crackle finishes under various trade names were quite popular several years ago. Several companies made them. In a letter we are sending you names and addresses of a few concerns who may be in position to supply what you want.—Ed.

Flock Finishing

One of our customers in Atlanta, Ga., has written us requesting information on the application of flock finishes. They are planning to use this type of finish over small objects made of cast aluminum. They are also interested in learning whether or not a special type of spray booth should be used, and they say they can either air dry or bake under infra-red heat lamps.

We believe that "Industrial Finishing" carried detailed information regarding this type of finish some time ago, and are wondering if you would be kind enough to forward tear sheets on this article to the company.—J. J. Co.

A feature article on the subject appears in this issue of the magazine.—Ed.

Instruction on Spraying

In your July issue of "Industrial Finishing," we noted with particular interest an article about "Training Operators to Spray Correctly," by Floyd Cohagan. Mr. Cohagan spoke of a booklet of instruction for spray painters. We are interested and wish you would advise us if this booklet may be obtained from the author. —R. Products Co. (Travelo Coaches).

Mr. Cohagan advises us that he does have something on spray finishing. Some of the spray equipment firms also have booklets on correct spraying technique. —Ed.

Spraying; Mixing; Baking

We are endeavoring to secure some information which might be helpful to our finishing department in the way of proper procedures for spraying, mixing and baking various types of enamel finishes.

We would like to inquire as to the possibility of your having available some bulletins or booklets which might contain general information pertaining to this type of work. Should you have anything of this nature available for distribution, we would appreciate your forwarding us copies of same. Any re-

Versatile Nu-Spede Interior Finish applies quickly, dries quickly, and covers solidly. Fulfills a wide variety of finishing requirements for consumer goods.

With light reflectional value, *proved over 85%*, Nu-Spede is the ideal finish for heating, ventilating and air conditioning unit housings, metal furniture, bicycles, cabinets, kitchen appliances, refrigerators and many other products.

This multi-purpose Finish can be made in *all* colors, semi-gloss or full gloss—to fit specific requirements.

A 4 to 1 reduction with Nu-Speed Reducer, is quickly spray-applied. It flows on smoothly—then air-dries dustfree in only 15 minutes.

It bakes in 15 minutes at 300° — and in 8 minutes under infrared (optional schedules are available). Nu-Spede bakes to a hard finish that resists abrasion and will not discolor.

For details on Nu-Spede write to

INDUSTRIAL SALES
THE LOWE BROTHERS CO.
DAYTON, OHIO

Lowe Brothers
FINISHES for Industry

commendations or suggestions which you might have to offer will be welcome. Likewise, we would appreciate receiving a copy of your "Industrial Finishing" for our inspection.—L. C. Co. (Refrigeration Equipment).

Information such as you mention, has been published in past issues of "Industrial Finishing"—and will appear in future issues. You might also be interested in R. H. Wampler's new book on "Modern Organic Finishes." This book contains a great deal of information of timely value to anyone in charge of production finishing. Copies of the book can be secured through "Industrial Finishing" at the price of $8.50 per copy.—Ed.

Tumbling Flat Plates

We have one particular problem in connection with the tumble finishing of metal parts. This particular part is a 3-in. square steel plate with a thickness of only .016-in.

The actual deburring of these parts is simple, but there seems to be a tendency for them to adhere to one another while in the tumbling barrel. Evidently, this adhesion of part to part is caused by surface tension created by the solution of water and burnishing powder used in conjunction with granite chips. Can you assist us in determining a solution of this problem?—H. R. Co.

Flat thin parts, especially as large as 3-in. square, are not suited to tumble-coating. It might help to put a lot of tumbling "jacks" or "marbles" in with a quantity of the flat plates, but this is questionable. We suggest separating them and racking them for dip-coating, or spreading them out on a flat-bed conveyor and spraying them, or roller coating them.—Ed.

Wood Grain on Metal?

We have been informed that a finish resembling the appearance of wood is available for aluminum. It will be appreciated if you will send us further details on such a finish as to how and where we can obtain it.—K. C.

We assume that you have in mind the reproduction of wood grain on metal. If so, we suggest that you direct your inquiry to one or more of the manufacturers or suppliers of wood grain reproduction equipment, or decals, which we are naming in a letter to you.—Ed.

Primers for Aircraft

This Station (Naval Air Experimental Station) is conducting a literature survey on primers for aircraft metal surfaces. In furtherance of this project, it is requested that you forward tear sheets of the article by Paul O. Blackmore, "Theory and Use of Zinc Chromate Primers," as published in May and June issues of 1944.—J.J.T. (Comdr., USN).

Tear sheets forwarded.—Ed.

Abrasion Testing

In March 1946 issue of this magazine you had a story, I understand, on tests made by Taber Abraser machine. We are extremely interested in this article and would appreciate your sending us tear sheets of the article as it appeared in the magazine.—L. P. (in Plastics).

Tear sheets have been sent.—Ed.

Crack Filler

For patching of both wood and veneered surfaces in the white or unfinished, we have always used a material manufactured by the "X" Paint & Color Co., which they called "Crack Filler."

This firm is not able to supply us with any more of this material. We find it does a much better job than some other materials that we have tried, and we would like to have you advise if you know of any other firm who manufactures a material that is similar to the one made by "X" Paint & Color Co.

There are some plastic materials on the market, but we do not find these usable because they are non-absorbent, consequently they do not take the stain.—Y. Furn. Co.

Several of the manufacturers of wood finishing materials can supply crack filler. Or, you might try San-Itai-Ric Filler Co., Division of G. J. Liebich Co., 931 N. Ogden Ave., Chicago 22, Ill. We believe this crack filler is available in several different colors, therefore we suggest that you specify what color or type of finish you have in mind in connection with the use of the filler, when writing the company.—Ed.

Bound for Library

We are subscribers of your magazine "Industrial Finishing," and bind the monthly copies at the end of each year. Now, unfortunately, the May copy has been lost. Naturally I am eager to get another copy before they are out of print. I wonder whether you could kindly let me have another complimentary copy, as you probably know how difficult it is to transfer money from here to you. May I offer you the March and April numbers in exchange? I have these in duplicate.—E. M. L., Librarian for Lewis Berger & Sons, Ltd., London, England.

May copy coming up.—Ed.

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Is a versatile coating material ideal for a wide variety of metal products such as hospital furniture, medicine and kitchen cabinets, scales, fluorescent fixtures, etc.

Easy flowing—High Lustre
Excellent retention of gloss
Tough and porcelain like finish
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Available in all colors

The baking schedules are easily adjusted to any baking procedure.

300 DEG. F. FOR 10 MIN.

275° F. for 20 min.—250° F. for 45 min.

[***Order 5 gallons of Flo-Bak Synthetic Baking Enamel today and give it a severe production test.***]

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Questions and Answers

Cost of Custom Painting Jobs

I am contemplating setting up an industrial painting business in a western town. My main problem is the cost of application.

I am now employed as a car painter and, along with several other ex-servicemen who are now employed at the same garage, I feel that the field for industrial painting in this region is lush. But, as I say, we have no idea as to what price to charge.

We have men experienced in the painting, block and tackle work and the advance work, but can find no one experienced in appraisal. Most of the work in this part of the country consists of oil tanks ranging in various sizes.—MIKE MORAN.

The pricing of custom and commercial painting jobs is practically always based on experience—previous experience with the same or similar work. If there is no experience on which to base your estimates, then your pricing will be guess work until after you have learned how much of the various types of painting an average workman can do per hour, day after day, and how much material will be used per item or per square foot of surface painted.

After you have obtained this information from whatever sources you can find—perhaps largely through trial and error—you set up a base rate of so much per man-hour of labor, which is always the largest item in your costs. For reasons of simplicity and convenience, this man-hour rate will be set to include not only what you pay your workers per hour for direct labor, but also your overhead plus profit. (Cost accountants can tell you about what goes into overhead, if you are not sure.) Then this hourly rate you set, multiplied by the total number of man-hours required or estimated to do a job, plus the cost of material for the work, equals the price to charge for the job.

The hourly rate you set up to charge for man-hours of labor will have to be 2½ or 3 or 3½ times what you actually pay for your skilled labor, depending upon how much equipment you have, how much rented space you occupy, and how much supplies (not direct materials) you use—all of which is included as overhead.

Suppose you pay your top workmen about $1.20 per hour. You decide that three times this or $3.60 per man-hour is a rate high enough (but not too high) to take care of your overhead and profit. You estimate that a certain job will take eight man-hours (eight hours for one man, or four hours for two men, etc.) and will require three gallons of paint and thinner which will cost about $2.50 per gallon.

$ 3.60 x 8 equals	$ 28.80
$ 2.50 x 3 equals	$ 7.50
Total Price for job	$ 36.30

It is simple and easy to figure this way and you can set down your figures right in front of your cus-

Wisely...

BEAVER METROPOLITAN COACHES RELY ON EGYPTIAN FINISH

Above — Beaver Metropolitan writes: "This coach, Egyptian-finished ten years ago, still in service and never refinished, looks as good today as when it left our shop".

Below — "Our late B-35 PT37 passenger coach. Of course this is also finished with Egyptian Lacquer". Here is pictured proof of Egyptian's enduring quality.

In modern transportation long-lasting good looks are an important economy. So is the long lasting protection which high quality finish affords. The eminence of EGYPTIAN finishes in the transportation field—in all fields where finish is important — is eloquent endorsement of the high quality standards which EGYPTIAN steadily has maintained through the years.

We invite your inquiry with regard to any finish problems.

THE EGYPTIAN LACQUER MANUFACTURING COMPANY

SPECIALIZED PRODUCTION FINISHES

P. O. BOX 444, NEWARK, N. J.

tomers if necessary, whereas if you set down all such items as "over hear," "profit," etc., they would "see too much" and some of them might be encouraged to try to beat down your quoted prices.

Recently I discussed this subject of pricing custom painting and finishing with the superintendent of a commercial enameling concern in a city. His small plant has metal cleaning facilities, dip tanks, spray equipment, bake ovens, portable racks and trucks, etc. It has been in operation several years. Customers bring in the work and take it away.

Up until recently this concern charged only $3.00 per hour, plus material, for custom finishing. Workers were paid about $1.00 an hour and less. The superintendent acknowledged that the firms pricing rate per man-hour was too low for present costs and that he had planned to up it to $3.50 or $4.00 per hour. This takes care of all overhead and profit. Material is added in on a cost plus basis. During last year's operations the total pay roll was about 47% of the company's volume of business in dollars and cents.

In estimating a job, this superintendent first analyzes the operations required and lists them separately. Then, basing his figures on experience, he estimates the number of items a man at each work station can handle per hour. What added handling operations are necessary must be included somewhere too. These may consist of placing small items on racks and removing same later, or other handling jobs that will count up in the cost of getting the job through the shop. Then the cost of material required is added in. This method of pricing custom painting and finishing jobs may not be scientific or exact but it is quick, simple, reasonably practical and can be kept operating with fair accuracy by any intelligent individual who will keep in close touch with the work and all of the conditions and costs entering into same.

Depending upon various conditions which will affect the work favorably or unfavorably, the final figure arrived at may be reduced a little or upped a little at the discretion of an experienced estimator who really knows what he is doing. Whenever possible, an actual check of all costs entering into a job should be made as it goes along, so that the actual cost can be checked against the estimated cost. This information will serve as a valuable guide in future estimating and it will help to keep future estimates more accurate and more safe.—C. C.

Finishing Metal Caskets

We are interested in learning what procedure you recommend for finishing caskets made from steel, copper or bronze so as to produce a metallic high-luster polished finish. These caskets will be finished with bronzing powders.

In outlining the program you consider best we would like to know the amount of material which should be used in the various coatings.

We are interested in finding out where to obtain information concerning the best technique possible to be used in polishing the caskets. We understand that the wheel-buffing method is preferable to the hand-polishing method, and that there are many factors to be taken

The ideal alternate for...
WHITES
Q: Is the scarcity of whites (base or finish coat) creating a bottle-neck in your production?
A. Use Watson-Standard R Aluminum System
The new R Aluminum System used as a smooth BASE COAT is not only equal to white but in many cases the metallic lustre gives a more pleasing appearance. The new R Aluminum System used as a FINISH COAT presents a good printing surface, and an attractive brilliant finish that is particularly appealing to the eye.
The new R Aluminum System, incorporating the latest war-proved scientific advances in the field of organic coatings, gives brilliant, durable finishes on steel, tinplates, paper and many other surfaces. It is adaptable to various baking cycles. Write for the Watson-Standard R Aluminum System Technical Data Folder.
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Prescription Finishes

into consideration, including compound, speed, size of wheel, etc.—X. Co.

Here is a typical procedure followed in putting an ornamental metallic finish on pressed steel caskets: First, of course, the metal surfaces must be made perfectly clean and dry, leaving not even the trace of a finger mark.

The first coating material is a lacquer type primer-surfacer. The average primer-surfacer, as it comes from the container, will have to be reduced about 50/50 by volume with lacquer thinner. About one quart of the ready-to-spray material will be needed for a full size casket. All of these materials, by the way, are sprayed.

Start the primer-surfacer by first spraying only the corners, edges and joints on the casket. Then follow with a full wet coat over all of the surfaces. This coat can be allowed to air dry for one hour, or it can be force-dried for 20 minutes at 180°F. Next operation is to wet sand the prime-coated surface with No. 320 wet-or-dry sandpaper and water. Clean the surface, dry it, and wipe it carefully with a tack rag.

Now comes a coat of bronze of the color or shade desired. The usual procedure—and this is important—is to first wet the measured quantity of bronze powder with lacquer thinner so it will then mix better with the lacquer-type bronzing liquid. If you have no practical experience to rely on, it will be necessary to experiment a little to find out just how much dry bronze powder to mix into a gallon (or a quart or pint) of bronzing liquid. Somewhere between 6-oz. and 14-oz. of bronze powder to the gallon of bronzing liquid is the quantity generally used.

With the bronze mixture prepared as just described, it will probably need to be thinned, perhaps in the ratio of three parts of bronze powder mixture to two parts of lacqer thinner.

Naturally, this prepared bronze finishing material must be continually stirred or agitated to keep it thoroughly and uniformly mixed. It is usually sprayed from a cup gun; and generally 1½ pints of ready-to-spray material will be enough for one adult size casket.

Tremendously important is this fact: Mix only enough bronze powder to coat the caskets that are ready for immediate spraying on one day. Avoid having any left-over bronze mixture at the end of a day's work, as it may be spoiled next morning. Some new developments in bronze powder materials have given us materials that can be left ready mixed overnight and longer without deterioration of quality, but unless you are sure that you have this kind—and you probably haven't—prepare only small batches of material that will be used immediately. The bronze coating, being of lacquer type, will air dry in five minutes or less.

Next comes shading, usually with a darker bronze or near bronze color, but sometimes with a lighter color. The lacquer shading color is usually something that will harmonize effectively with the over-all body bronze color. Shading is applied artistically and skillfully to corners, edges and wherever it will work in appropriately. It doesn't take much shading color per casket—often as little as 4-oz.

When the bronze finished caskets have been shaded they are ready

Remember Pearl Essence for

A Decorative Finish

MEARLMAID Pearl Essence is being used on hundreds of different products to produce a decorative and attractive effect.

Investigate the numerous advantages of a Mearlmaid Finish before you select the final coating. Its sales appeal and merchandising value are important.

THE MEARL CORPORATION

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Factories

ROSELLE, N. J. EASTPORT, ME.

Has High Reflective Light Value

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for one double coat (horizontal plus vertical spraying) of high-solids clear lacquer. In some of the high-priced caskets a second coat of high-solids clear lacquer is sprayed on after the first coat dries for about three hours. The last coat of clear lacquer is allowed an overnight drying before any rubbing or polishing operations begin.

There are several different ways of rubbing and polishing the final clear coat of lacquer. One method is to go over the surface lightly with a wet sanding operation, using No. 320 wet-or-dry sandpaper and water. Another way is to rub the surface with medium rubbing compound, and then finish with polishing compound. This final rubbing and polishing is strictly hand work.

Portable mechanical equipment has been tried for polishing, but owing to the contour of casket exteriors and the character of metallic finishes which cannot be readily repaired, it seldom works satisfactorily. Power polishing is "tricky" and likely to damage the finish. Perhaps an experienced and skillful demonstrator, working under ideal conditions and perfect lighting, could polish a metallic finished casket with a suitable buffing pad or hood on a power machine, but in average routine production work these ideal conditions do not exist. When a casket has gone through all of the operations needed to bring it up to this final stage of polishing (labor plus time plus material) few manufacturers feel inclined to trust its polishing to the mercy of an average workman using a power driven tool.—Y. Z.

Dip Coating Bed Springs

We are confronted with the problem of proper agitation in our paint dipping tanks to enable us to use a thinner coat, and prevent streaking.

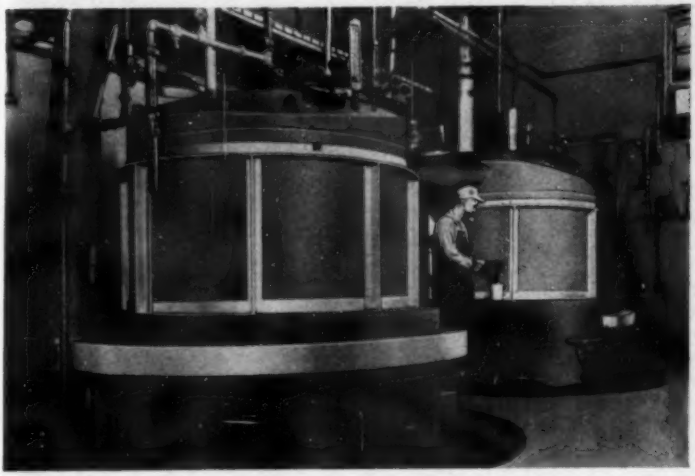
At the present time we are using an oleo-resin type of green dipping enamel. The article causing us concern is a metal bed spring, which is 4 ½-ft. wide by 6-ft. long. The dimensions of our tank are 5 ½-ft. long by 2-ft. wide by 7-ft. deep.

We find that after we have dipped the springs and hang them up for the drip off, the paint from the little coils running down the slats cause a streak of approximately 10-in. Could you suggest a method of dipping that will give us a uniform coating, without streaking? —U. I. Co.

Proper agitation of paint in deep dip tanks can best be accomplished by using a circulating pump to draw off the thinner materials at the top of the tank and inject them into the bottom of the tank (or near the botton) so as to dilute the heavier materials which naturally accumulate there.

Regarding a method of dipping bed springs to prevent streaking, this could be done by withdrawing them slowly from the paint at a rate which corresponds to the natural flow-off of the paint. This would require expensive equipment.

Metal bed springs are being dipped in other factories without objectionable streaks. Both vertical dip tanks and shallow horizonal dip tanks are used. The type of paint used and cleaning prior to dipping are important.—H. R. MADSON, Industrial Consultant.



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. . . in the top quality of O'Brien Industrial Finishes are shown above. These giant autoclaves were specially designed by O'Brien technicians for compounding oils and resins used in paints, varnishes and enamels. Modern equipment and techniques insure O'Brien users of the very finest finishes.

There is an O'Brien finish for every industrial use. Let us quote on your requirements.

O'Brien Varnish Company, South Bend 21, Indiana

O'BRIEN

INDUSTRIAL FINISHES

SINCE 1875

NOT THE MOST – JUST THE BEST

Electric Insulation Paint Coatings

We are very much interested in learning whether or not there is available a type of paint that could be sprayed on to an aluminum metal, and which would make the metal non-conductive.—N. E. L.

We have made a limited number of tests of electrical insulating coatings for use on aluminum, and while our tests were not extensive we have a few suggestions which might be of interest to you.

There are on the market a number of commercial wire enamels which do have reasonably good insulating properties. In the test that we conducted they showed breakdown voltages in the vicinity of 500 volts per mil thickness of coating.

We also examined a number of synthetic resin solutions and found that some of these had very good insulating properties, among which should be mentioned methacrylate resins and phenolic resins.

We suggest that you contact some of the makers of metal coatings who advertise in this magazine. Ask for their best and more up to date recommendations. For best results we suggest that the coating be applied at a thickness of not less than 0.002-in. Prior to painting, the surface of the aluminum should be treated with an aqueous solution of phosphoric acid in grease solvents. Solutions of this type can be obtained from firms that make or supply metal cleaning and treating compounds.—S. Co.

Executive Personnel added to American-Marietta Co.

Appointment of Ralph F. Souter and David E. Eichelberger as vice presidents of the American-Marietta Co. is announced by Grover M. Hermann, president. Mr. Souter, in addition to his duties as president and general manager of the Ottawa Paint Works, Ltd., A-M Canadian division, will also be responsible for the expansion of operations in Southern California.

Mr. Eichelberger, division manager at Marietta, Ohio, is now located in the Chicago office and has been succeeded at Marietta by Dr. L. E. Davis, formerly with a large maker of finishing materials in Indianapolis.

These additions to the executive staff were made to expedite the company's nationwide expansion program.

Sammet is Research Director for Mitchell-Bradford

Mitchell-Bradford Chemical Co., 2446 Main St., Stratford P. O., Bridgeport, Conn., announces the appointment of Robert T. Sammet as Director of Research.

Mr. Sammet is a graduate of Union College, Schenectady, with special graduate training at Syracuse University, and also the Institute of Paper Chemistry at Appleton, Wis. He spent 3½ years in the Navy as a Lieutenant and then became associated with The Mitchell-Bradford Chemical Co.

MR. WOOD FINISHER

Is YOUR supplier's name here?

Adams & Elting Co.
Advance Paint Co.
American Paint Works
Atlantic Lacquer Mfg. Co.
Atlas Powder Co. (Zapon Div.)
Ault & Wiborg (Div. Interchemical Corp.)
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Andrew Brown Co., Inc.
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Clover Leaf Paint & Varnish Corp.
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Ferrell Paint Co.
Flood & Conklin Co.
Forest City Paint & Varnish Co.
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Grand Rapids Wood Finishing Co.
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India Paint & Lacquer Co.
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R. F. Johnston Paint Co.
C. E. Krieger Co.
Lawrence-McFadden Co.
Lenoir Wood Finishing Co.
Lilly Co.
Lilly Varnish Co.
Lindeman Wood-Finish Co.
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New England Coating Works, Inc.
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Nubian Paint & Varnish Co.
N. Y. Woodfinishers' Supply Co., Inc.
Old Master Stain Co.
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Rockford Varnish Co.
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Edward J. Shannon Co.
Southern Varnish Co.
Gilbert Spruance Co.
Sun Chemical Corp.
R. H. Thorpe Paint Co.
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Trojan Lacquer Co.
Twin City Varnish Co.
U. S. Lacquer & Chemical Co.
L. R. Van Allen Co.
Wabash Products Co.
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Wolverine Finishing Materials Co.
Woodfinishing Products Co.
CANADA
Murphy Paint Co., Ltd.
Penfound Varnish Co., Ltd.

These manufacturers are licensed under the Chadeloid patents. They will gladly supply you with genuine Chadeloid non-grain-raising, non-bleeding, color-true wood stains and combination stain-fillers.

If YOUR supplier's name is NOT listed above, ask him to get in touch with us. Any manufacturer who maintains our standards is eligible for a Chadeloid license.

CHADELOID CORPORATION

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U. S. PATENTS—1,877,748—1,898,247—1,930,768—1,977,345—2,000,120—2,000,121—2,044,770—2,093,424—2,105,984—2,161,503. CANADIAN PATENTS—330,344—343,162—343,163. Applications pending.

Materials Supplies Equipment

"Prismlac" Decorative Coating

A new lacquer enamel which air dries to prism-like formations is announced by Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J., manufacturer of specialized production finishes. The new coating, "Prismlac," produces attractive crystallizations on glass, steel, aluminum, brass and copper. It can also be used on close grain wood, such as birch and maple. Prismlac is available in a variety of colors, including black, red, maroon, and green, and is also obtainable as a clear finish.

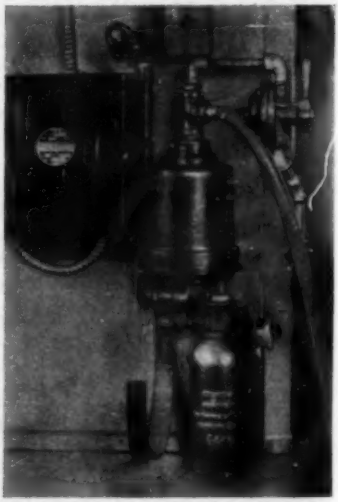
Cleans Compressed Air for Spraying

The Aridifier, manufactured by Logan Engineering Co., 4900 Lawrence Ave., Chicago, Ill., employs centrifugal force for removing foreign matter from compressed air. It is easily installed in the air line between the compressor or receiver and the point of application.

Compressed air passing upward through the unit revolves the rotors at high speed and in opposite directions. All moisture, oil, dirt and fine scale which the air contains become impinged on the rotors, where they are carried by centrifugal force to the edges of the rotors. From here, because of the taper of the rotor rims, the impurities are dispersed—again by the positive action of centrifugal force—to the housing wall. Being out of the air stream, the contamination flows down and out of the housing into a trap below.

Periodic cleaning of this trap is all the attention the Aridifier requires. In many cases the amount of oil and dirt-laden water that accumulates in the trap is surprising.

The Aridifier operates at no back pressure, as there are no parts which clog or impede the flow of the air stream. Maintenance is obviated because there are no parts to break, wear rapidly, or become inoperative.



Aridifier installed in compressed air line.

NEW PERIOD
Production Finishes

BAKING ENAMELS | LACQUERS SHELLAC | ENAMELS FILLERS | SEALERS SUPPLIES | PRIMERS STAINS | SYNTHETICS VARNISHES

REDUCING COSTS

Finishing costs are determined by quantity of production, hours of labor per unit of production and by the methods and materials used. The greatest opportunity for cutting costs is in improved methods of production and in the selection of the right materials that will work efficiently and produce the desired results.

NEW PERIOD LACQUERS and other special type finishes are specially formulated to meet specific production requirements. They are reducing costs for manufacturers because they are easy to apply, dry fast and produce a beautiful finish. The complete NEW PERIOD line includes sealers, gloss, semi-gloss, clear and pigmented lacquers.

Manufacturers who have a finishing production problem or who are interested in better finishes and lower costs are invited to submit their problems to us. You are assured of prompt and efficient service.

NEW PERIOD
Production Finishes

NEW YORK WOODFINISHERS' *Supply Co.*

Fire Hose Doesn't Mildew

American - LaFrance - Foamite Corp., Elmira, N. Y., announces a new "All-Weather" line of water-repellent mildew-resistant fire hose. It is made exclusively for American - LaFrance by the Goodyear Tire & Rubber Co.

Concrete Floor Hardener

Concrete floor dusting is stopped instantly and longer life for concrete floors can be obtained through the use of Stonhard Stontop. Easily applied to new or old concrete floors, Stonhard Stontop penetrates and by chemical reaction with the cement, hardens and fortifies the surface against the effects of acid, grease, oil, and abrasion. It helps to keep floors smooth, safe, and sanitary. A product of the Stonhard Co., 403 N. Broad St., Philadelphia, Penna.

Prevents Bleed-Through of Maroons and Reds

A new type of coating composition for automobile refinishing that prevents "bleed-through" of maroons and reds, introduced briefly in limited quantities in 1941, is again available, the Du Pont Finishes Division announces.

Du Pont Bleeder Seal is a pyroxylin product applied directly to the old red or maroon finish. By virtue of a special ingredient which serves as a kind of blotter, bleeding pigments are absorbed and thus prevented from discoloring the topcoat.

No special skill or technique is required in spraying the material. Like other pyroxylin products, it is fast-drying and provides excellent adhesion for topcoats, without affecting durability.

S-W Fluid Tinting Colors Require no Thinners

A new line of "Fluid Tinting Colors" which need no pre-mixing with thinners, and which can be poured directly into interior and exterior paints to produce hundreds of colors ranging from delicate pastels to brilliant deep colors, is announced by the Sherwin-Williams Co., Cleveland, Ohio. The line includes 18 basic colors and replaces the pre-war paste-type colors in oil.

The new tinting colors blend easier than pre-war tinting materials because they are more finely ground and diffuse evenly throughout the paint to the shade desired.

A new synthetic base, plus a new vehicle in the formulation, makes these tinting materials adaptable for all types of paint except lacquers and water-thinned paints. The new vehicle reduces "ghosting" and "flashing" to a minimum. The new vehicle makes possible the blending of much deeper colors, which are so popular today.

Clear Coating Conducts Electricity

A revolutionary development by the Pittsburgh Plate Glass Co., Pittsburgh, Penna., involves the use of a transparent electrically conductive coating on glass whereby de-icing and de-fogging can be efficiently and economically realized by the application of electrical energy.

The Pittsburgh Plate Glass Co.'s "Nesa" is a transparent, durable, electrically conductive coating. When applied to a glass panel its unique properties make it possible to heat the entire area of the panel by the uniform flow of elec-

All wrapped up in his work

The python's skin is a versatile surface covering. It stretches wide to hold an oversize meal, then snaps right back into perfect shape. It gets as much wear as a heavy-duty tire, and stands up. When the python feels like a change, he merely grows another skin, then shrugs the old one off.

If you have a surface coating problem, use lacquer. It's the snake skin's only rival for versatility. Lacquer is easy to apply, durable, attractive, fast-drying. Your lacquer supplier would like to tell you about it in more detail.

CSC makes solvents and plasticizers, but is not a lacquer manufacturer.

COMMERCIAL SOLVENTS *Corporation*
17 East 42nd Street, New York 17, N. Y.

trical energy across one of the glass surfaces without distorting visibility through the panel, and with no serious reduction in the intensity of luminous transmission. In its present stage of development the reflection of a glass surface treated with "Nesa" is somewhat greater than untreated glass. Also, a "Nesa" surface produced by the present methods presents an iridescent appearance by reflected light because of selective reflection of different wave lengths of light and interference effects resulting from slight variations in thickness. However, both the intensity and the color variation of reflected light are minimized by laminating the "Nesa" surface to another plate of glass with an intermediate bonding layer of vinal plastic. The unaided eye can detect no color differential in transmitted light and the visual characteristics are approximately the same as untreated glass when employed in vinal laminates.

High Pressure Steam Cleaning

A new streamlined steam cleaning machine known as Model JO Hypressure Jenny Instantaneous Steam Cleaner is announced by Homestead Valve Mfg. Co. of Coraopolis, Penna. It is a compact, portable, steel-fabricated, electric-welded unit with all machinery end-mounted and fully accessible. Oil or gas-fired units are optional, and the only requirements for operation are an electric current outlet and a hose connection to water supply.

Cleaning is accomplished by a highly atomized mixture of steam, hot water and cleaning compound applied under pressure through a spray nozzle. Normal operating pressures range from 80 to 120 lbs. at 90 gallons per hour water capacity. Where powerful flushing and rinsing action and extra water capacity are required, the use of the new Adjusta-Blast Gun is recommended, which increases water capacity up to 480 gallons per hour.

Continuous Air Drier

A machine designed to dry loaded racks of work continuously before or after cleaning is announced by the Optimus Equipment Co., 209 Church St., Matawan, N. J., manufacturer of metal washing and drying equipment.

The machine is continuous in its operation, and works almost completely closed. It can be connected to an exhaust blower, so that all fumes can be drawn off. Any heating system, steam, gas, or electricity, can be employed. Drying time is usually from 4 to 6 minutes.

The cold air system includes a blower and a series of nozzles. The hot air system includes an air-heater, re-circulating blower, a damper to adjust the mixture of atmospheric air and re-circulating air, and the necessary nozzles.

Start and Save More Trees

The present shortage of lumber is partially due to the tremendous consumption of wood in this country. The United States uses more than half the lumber, more than half the paper, and two-fifths of all forms of wood consumed in the world, and yet it has only 9.1% of the world's forest area. Russia has 21.1%; the British Commonwealth of Nations, 21%; Brazil, 13.4%. The balance is divided among 50 other nations, according to The New York State College of Forestry at Syracuse University. It is plain that in the United States (the largest consumer of wood) the application of scientific forestry is one of the most important problems of government.

It's Tough—tougher than the ordinary lacquers!

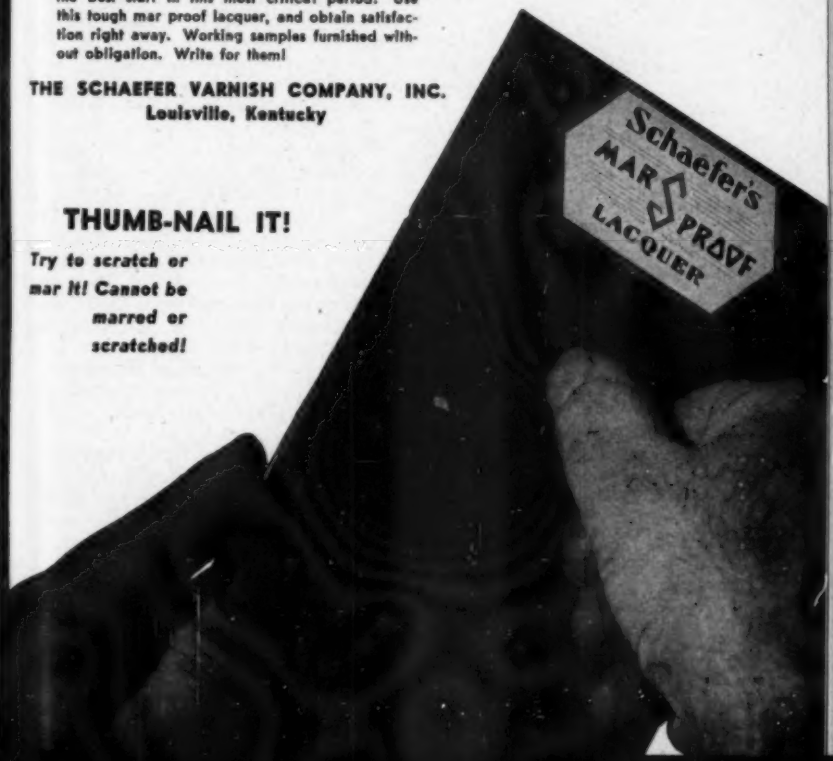
Yes, here's a tough piece of goods, a lacquer finish that will meet the most critical requirements of current production. Try it out; give it all the tests necessary to satisfy yourself and you will accept nothing less than this product finish that endures the elements, and the hardships of constant usage. Schaefer's Mar Proof Lacquer is a finish that cannot be marred or scratched. Made in either clear gloss rubbing or satin finish, it produces a splendid transparent coating of full depth on maple, walnut, gum, mahogany and other cabinet woods. Economical; gives plenty of coverage; dries quickly. Our Mar Proof Lacquer Sealer is recommended with it for a first-coater.

A Schaefer Mar Proof Lacquer finish will give you the best start in this most critical period. Use this tough mar proof lacquer, and obtain satisfaction right away. Working samples furnished without obligation. Write for them!

THE SCHAEFER VARNISH COMPANY, INC.
Louisville, Kentucky

THUMB-NAIL IT!

Try to scratch or mar it! Cannot be marred or scratched!



Random Comment on the Industrial Scene

(Continued from page 8)

half that total were actually assembled.

There is a wide difference of opinion concerning the true consumer backlog, in view of the fact that so many duplicate orders have been placed. Yet it is felt that there are at least five million **bona fide** orders on dealers' books at the present time, with overall demand being twice that figure.

With thousands of additional cars destined for the scrapheap every month, it is confidently expected that several years of capacity production lie ahead. If labor strife is held to a minumum during the remainder of 1946, there is a possibility that Detroit might be able to turn out half a million cars and trucks monthly in the final quarter of this year.

* * * *

Real Estate Inflation—In no area of our economy, warns Elliott V. Bell, New York State Superintendent of Banks, is the current inflation so plain as in the field of real estate. Furthermore, he adds, there is nothing in the picture that would render it immune from the effects of a general postwar depression.

"Should the level of national income fall materially," adds Bell, "should unemployment and depression return, then certainly we would see a considerable part of the present demand for housing disappear." He declares that any abrupt return to prewar real estate prices would be accompanied by considerable hardship in the entire economy, bringing on business failures, unemployment, and distress.

Decline and Output—A firm warning on American production trends has been given by J. J. Thursh, vice-president of R. H. Macy and Co. of New York. Production per man-hour has been dropping steadily since the end of the war, he states, at a rate which is "little short of alarming."

Unless this destructive pattern is checked in the near future, he continues, a drop in our living standards is inevitable. "The surest way we can continue to enjoy a steadily rising standard of living within the framework of our democratic way of life," concludes Thursh, "is for us to continue to produce and consume more and more useful things."

* * * *

Television Preview—Emerson Radio & Phonograph Corp. expects to produce almost 10,000 television sets by the end of 1946. All units are described as authentic postwar models, with a table receiver designed to retail at about $150.

The company also has a set priced around $250, which is said to be a finer instrument than the prewar model that sold for twice the amount. This chair-side model has 32 tubes, including a 10-inch cathode ray tube. It is designed to tune to all television frequencies. This model is housed in a walnut console, and includes a 12-in. speaker.

Although some critics insist that the television industry should wait for the development of color transmission, Emerson takes the stand that several years of further research will be required to reach that goal. In the meantime, the firm argues that evolution of this new entertainment medium must be given every opportunity to stem

(Continued on page 108)

Enticing

Just as cool, refreshing waters entice the bather, a beautiful finish on your product entices the buyer.

Endow your product with an alluring, tempting finish . . . for as the coating is the final step in production, it is the first step toward sales. Our competent staff of highly skilled artists will undertake your finishing problem with a critical viewpoint, and consider all details before they conceive the coating that best fits the purpose.

Our Creative Studio is ready to serve. We invite reputable firms to take advantage of our service at no cost or obligation whatever.

No Tampering with Quality

ROCKFORD VARNISH Company
ROCKFORD ILLINOIS

Manufacturers of Protective and Decorative Coatings

from the use of black and white projection.

* * * *

Service to Visitors—Readers of *Industrial Finishing* are reminded that free tickets to many leading radio broadcasts are available on request. When planning a visit to Manhattan, drop a line to: *Lawrence H. Singer, 130 West 86 St., New York 24, N. Y.* Among the co-operating sponsors are:

Prudential Insurance Co. ("The Family Hour"); The Texas Co. ("Texaco Star Theatre"); and Town Hall ("America's Town Meeting").

Promoting Friendly Labor Relations

BY S. J. TREZAC

TODAY, WHEN crucial labor-management disputes heighten interest in all matters pertaining to better industrial relations, the thinking of one "amateur" stands out like a beacon shining through the black of night.

Who is he? Edward Gillies, a supervisor who has risen from the ranks of factory workers at the Philco Corporation's Philadelphia plant. Believing that the keystone to successful plant management is the supervisory branch, he advocates injecting the "human touch" in industrial relations.

Many supervisors and foremen would do well to digest the Gillies' labor - management philosophy. Sparkling with down - to - earth common sense, it represents a sound realistic approach that often escapes many of the so-called "experts" who tackle the ticklish problem of employer-employee relations.

"To the worker," he says without fanfare, "management is simply the lengthened shadow of the supervisor. *To the worker the supervisor is management, and to management, he's the worker.*"

Gillies holds, first of all, that due to this unique position as the liaison between two oft-opposed groups, a supervisor should get more attention from top-level executives. Equipped with a sound knowledege of his job, as well as of the industry which he serves, on the one hand and possessing a thorough understanding and appreciation of overall management problems and their complexities, a supervisor is a key cog in the organization machinery.

To function at real efficiency, Gillies further maintains, he must have both the management's confidence and workers' respect and regard. The "front office" can materially contribute to this dual requirement by consulting production superintendents and supervisors more freely, or simply by giving them an occasional pat on the back when they deserve it. In industrial relations, as with so many other phases of business, the little things count a lot.

"Too many of us," this supervisor asserts, "have no notion of anything outside of our immediate jobs. We work in the plant during the day and then go home, shedding the job as we pass the gate. There is little real knowledge in the job as it relates to the larger picture of the plant's overall production. A man with no greater interest than that soon gets in a rut and his value to management is reduced."

Usually, this Philco supervisor continues, this condition is the fault of management because of

You want speed. You want positive drying. You want low costs. You want durability. You get 'em all in Pratt & Lambert Industrial Finishes.

PRATT & LAMBERT-INC.
Industrial Finishes
NEW YORK BUFFALO CHICAGO
FORT ERIE, ONT.

what he calls "the iron curtain" hanging between the front office and the production plant. Removal of that curtain is imperative if the supervisor is to represent management to the workers, and the workers to management.

But the supervisor's relationship with the men working under him holds equal importance. With each of his workers his relationship must be friendly and personal. He must have tolerance, plus due consideration for the worker's emotional side. "Don't be cold," Gillies advises fellow supervisors. "Make a guy feel that he belongs. You'll get more and better work if he thinks you are his friend."

But what good are ideas if you can't apply them? Gillies has applied his. Having these points in mind, he promoted an organization of supervisors in the Philco factory. Only through a free exchange of ideas made possible by relaxed conditions in a friendly social atmosphere, he felt, could the supervisory staff profit by each others' experience. By mutually sharing problems of production and human relations, he believed, supervisors could secure additional knowledge of the company for which they work and of the human factors affecting production. The principal objectives of the Supervisor's Club are: It seeks to contribute to the growth of the modern supervisor as a man and as a leader of men; to help understand better the responsibilities of supervisory work and improve the administration of those responsibilities; to increase his usefulness to the industry he serves and the community.

Currently the club has about 100 members on its roll—supervisors, foremen and superintendents in the salaried group—who meet once a month to hear a speaker discuss such subjects as general problems in industry, technical problems of supervision, training for the job, world affairs. This is followed by a good open-forum discussion.

Similar projects carried on by supervisory groups organized along similar lines in countless other firms would prove instrumental factors in eliminating industrial strife and assuring peace and prosperity to both management and labor.

Spraying Calls for Clean Air

BY HENRY H. LOGAN
Logan Engineering Co.

A PRIME SOURCE of rejects of sprayed work is the contamination present in all compressed air as it comes from the compressor. Any sprayed work that can be damaged by moisture, oil, or dirt—and this takes in a wide range of products—is subject to a high rejection rate if the method of removing these impurities from the compressed air, which serves the spray equipment, is not fully adequate. In many plants a check-up on the rejects caused by contamination in compressed air, would reveal surprising losses. *(Cont'd p. 112)*

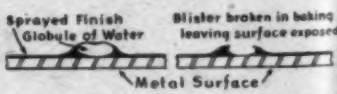


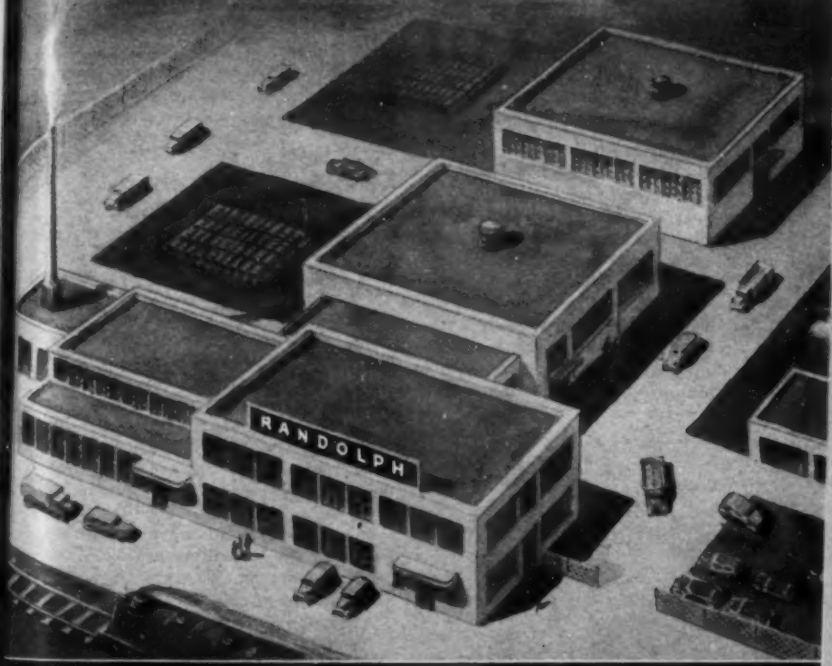
Fig. 1—Sketch showing how a drop of water deposited on a sprayed surface has turned to steam in the baking oven, bursting the "skin" and leaving an exposed surface which will permit rusting.

ANOTHER RANDOLPH ACHIEVEMENT!

A Really Reliable

TEXTURE (WRINKLE) ENAMEL

Prompt Shipment



DOPES · LACQUERS · ENAMELS

RANDOLPH

FINISHING PRODUCTS CO.

Carlstadt New Jersey

Where finishes or protective coatings are sprayed on, the general quality of the surfaces, in addition to the rejected units, is bound to be below par if contamination is not continuously and thoroughly removed from the air. The drawing marked Fig. 1 shows what frequently happens to the surface when blobs of water are present in compressed air used for applying sprayed finishes.

Obviously, methods which effect only partial removal of moisture, oil and dirt are not good enough for the compressed air used in spraying operations. Air cleaning equipment which functions with decreasing efficiency will likewise result in a correspondiing decline in the quality of the sprayed surfaces.

Quality of sprayed work has been maintained and rejects reduced to a minimum in a large number of plants by the use of an air cleaning unit known as the "Aridifier." This device removes moisture, oil, dirt and fine scale from compressed air, and it functions at constant efficiency year after year, with a minimum of attendance and maintenance. Centrifugal force, applied by means of a series of rotors, removes foreign matter from the compressed air.

Fig. 2—Air cleaner installation.

The device is easily installed in the air line between the compressor or receiver and the point of application. Compressed air, passing upward through the unit, revolves the rotors at high speed and in opposite directions. Moisture, oil, dirt and fine scale in the air become impinged on the rotors and are carried by centrifugal force to the edges of the rotors. From here, due to the taper of the rotor rims, the impurities are dispersed—again by the positive action of centrifugal force—to the housing wall. Being out of the air stream, the contamination flows down and out of the housing into a trap below.

See Other Shops' Methods Too

BY ELTON STERRETT

VACATIONS have long been considered a part of the working year for every employee on a stated salary. Little or no control over the employee's vacation period is attempted by the employer, who desires to avoid charges of a paternalistic attitude toward his staff. Since the idea back of a vacation is to get as great a change as possible from daily routine, no encouragement is offered for doing the same type of work elsewhere, during the scheduled period of absence from the job.

In the steel industry, shortly after World War I, an experiment was started in "work vacations." It died of malnutrition during the lean years of the nineteen-thirties; but it might well be revived and practiced by many firms today to their mutual advantage. The plan

INVESTIGATE!

COLORED TONERS

They Add

AN IMMEDIATELY RECOGNIZED

Plus

TO WOOD FINISHES

★

The Cost Is Low
The Rewards Great

Exclusive Product of

GRAND RAPIDS VARNISH CORP.

GRAND RAPIDS, MICHIGAN

Makers of the famous Craftsman Finish

involves the granting of a period—two or four weeks—during which selected employees, usually young foremen, are relieved of their duties in the plant. They receive an expense account and an elastic itinerary. They visit plants similar to the one to which they are attached—competitors' if you will—and observe how common problems are met and solved in the other fellow's factory.

The plan varies from the earlier practice of introducing employees surreptitiously into competing plants, in that the "visitors" in most cases are provided with cordial invitations from plants on their lists.

This plan involves no attempt to analyze processes. As one executive put it, "our only secrets are in our laboratory, and no foreman is scientist enough to shine there—or that's where he'd be working."

This visiting and the benefits derived from it are not one-sided. Out of the discussions which spring up between visitor and host, mutual benefit is always derived. Given an opportunity, the newcomer compares how his own plant does a job better or not as well as the way he is watching it done. Thus the outside viewpoint of a visitor may lead to the improvement of an operation which, until then, was considered by the management as being adequately handled.

The plan of these "all expense working vacations," as these expeditions are carried on one company's books, is intended to supplement the assistance secured through Trade Association membership, reading trade journals, and inter-plant study of planning and processing. Occasionally the plan may seem to backfire—as when a promising man is hired by the management of a plant he is visiting—but the supervisory turnover in the average plant giving "busman's holidays," as outlined, is less than in a similar but self-sufficient plant under like operating and economic conditions.

Fireproof Lacquer?

ABOUT 30 YEARS ago I met a lacquer salesman who claimed he was selling a fireproof lacquer. He sold quite a lot of it. To demonstrate that his lacquer was fireproof he would fill a small can with the material, and then drop a lighted match into it. It would not catch fire.

One day one of his customers—a large firm in Connecticut—had a visitor. The foreman explained that he was using a fireproof lacquer. To prove it he threw a lighted match into it, but it promptly caught fire and there was a big blaze. After a short time the "fireproof" chemical with which the lacquer was "fixed" evaporated and then it was like any other lacquer. The firm making the material withdrew it from the market.—STEVE.

J. C. Leonard Becomes Sales Manager for Oakite

Oakite Products, Inc. (specialized cleaning materials and methods), New York, announces the appointment of J. C. Leonard as Sales Manager of its Industrial Marketing Division. Associated with the Oakite organization in the servicing of its specialized cleaning materials and equipment for over 22 years, the last 16 of which was in the capacity of manager of the company's Chicago Division, Mr. Leonard assumed his new duties on September 1, 1946. He is directing the marketing and servicing activities of Oakite's industrial field staff from the general offices of the company in New York.

GOVERNMENT OWNED **SURPLUS** PROPERTY

INDUSTRIAL FINISHES

METAL PRIMERS
Zinc Chromate Primer Spec. AN-TT-P-656 — $1.20 per Gallon
Synthetic Primer for Ferrous Metals Spec. 3-171 — .45 per Gallon
Lacquer Resistant Synthetic Primer Spec. 3-183 — .45 per Gallon
Synthetic Rubber Wash Primer Spec. 3-172A — .45 per Gallon

PIGMENTED LACQUER
Instrument Lacquer Spec. 3-165 — $ .50 per Gallon
(This price applies to all colors except Olive Drab)

SPECIAL
All Olive Drab Paints—Lacquers—Enamels — $ .20 per Gallon
(Minimum order quantity 200 gallons)

RED LEAD PAINT
Ready Mixed Red Lead in Oil Paint — $2.40 per Gallon
(50,000 one-gallon cans in the inventory, all the Tacoma, Wash., Regional Office)
Spec. 3-104-E

ACID PROOF BLACK PAINT
useful for many purposes — $ .16 per Gallon
Chlorinated Paint Spec. T-1379
All other colors
(A Utility Maintenance Paint) — $ .30 per Gallon / .49 per Gallon

PRICES ARE F. O. B. LOCATION

HOW TO GET THE *Paint* YOU NEED

YOUR Regional Office of the War Assets Administration can now supply you immediately with complete information regarding *low* cost paints, lacquers, enamels, varnishes and other protective coatings. Large quantities of these surplus materials, all made to exacting government specifications, are available in many types, colors and quantities . . . from which to select for your specific requirements. More important, a special inter-regional service has been set up to locate just what you want, should supplies be exhausted in your own region.

In addition to paints and enamels for general use, there is a wide selection of *special* purpose finishes. Prices offer attractive savings to machinery and equipment manufacturers, plant maintenence departments, painting contractors, wholesalers, dealers and others interested. Containers usually range in size from one to 55 gallons. It will pay you to get complete information IMMEDIATELY.

Although this material has been previously offered to priority claimants, 10 per cent of the merchandise has been reserved to fulfill any further needs of priority claimants including VETERANS OF WORLD WAR II who are invited to contact the Regional Office serving their area.

EXPORTERS: Most surplus property is available to the export market. Merchandise in short supply is withheld from export and if such items appear in this advertisement, they will be so identified by an asterisk.

WAR ASSETS ADMINISTRATION

Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Fort Worth • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Oklahoma City • Omaha • Philadelphia • Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane

GOVERNMENT OWNED SURPLUS

469-3

Booklets Catalogs Circulars

Match-O-Stain Folder

A small folder that explains something about matching and blending stains for wood finishing and refinishing has been published by H. Behlen & Bro., 10 Christopher St., New York 14, N. Y.

Crystal Finishes Bulletin

Decorative and protective treatment of rough, non-porous surfaces with black or clear crystals for a sparkling effect is outlined in a 4-page bulletin offered by the Hilo Varnish Corp., 60 Stewart Ave., Brooklyn 6, N. Y.

Everything for Silk Screen Process Work

A new indexed catalog of 24 pages 6x9-in. lists and illustrates all of the materials, supplies and equipment needed for modern silk-screen process work. Methods of using the equipment are also illustrated. For a free copy, write Nax-Dar Co., 469 Milwaukee Ave., Chicago 10, Ill.

Spray Equipment Catalog

Eclipse Air Brush Co., 410 Park Ave., Newark 7, N. J., announces a new 44-page catalog in three colors, describing the complete line of Eclipse low-pressure spray equipment.

A primary feature is the series of simple tests by which any spray equipment user can easily judge for himself the value of low-pressure spray equipment. This is followed by information on all Eclipse equipment now available. Manual and automatic spray guns, nozzles and tips for all materials, extension nozzles and extension guns, accessories, pressure tanks and control heads, portable painting units (both gasoline and electrically powered), stationary compressors, and Pneumix air-motored agitators are completely described.

Throughout the catalog application photographs supplement the product detail and indicate the wide range of uses for Eclipse equipment.

Pressure Cleaning Bulletin

A 2-page specification circular describing the new Model JO Hypressure Jenny Instantaneous Steam Cleaner has been issued by Homestead Valve Mfg. Co., Cornopolis, Penna. It will be of special interest to anyone having problems in the cleaning of machinery, parts, automobile engines and chassis, floors, walls, windows, etc.

Pickling Tank Tests

"Quick, Accurate Pickling Tank Tests," is the title of a folder recently issued by Ferro Enamel Corp., 4150 E. 56th St., Cleveland, Ohio. The contents describe an "on the spot" check available for determining the strength of pickling tanks and iron content of tanks. The spot check is in the form of Ferro Pickle Pills, patented and manufactured by the company.

Protective Coating Bulletin

A new comprehensive 8-page technical bulletin, streamlined for ready reference, gives complete factual information in condensed form about the entire Amercoat line. All industries having corrosion and contamination control problems will appreciate its practical approach to an ever-present problem.

The chart shows all characteristics and properties of Amercoat plastic coatings. Also, it is a ready guide for selecting the proper coating, preparation of the surface, and application methods on steel, concrete and wood. In addition, cost per square foot for materials, with area formulas is provided.

For a free copy of this useful chart, write Amercoat Division, American Pipe & Construction Co., P. O. Box 3428, Terminal Annex, Los Angeles 54, Calif.

Fire-Protection Handbook

A new 20-page booklet entitled "How to Fight Fires and Protect Property" has been published by Randolph Laboratories, Inc., 8 E. Kinzie St., Chicago, Ill. This handy folder graphically explains and illustrates the latest techniques in fighting fires with carbon dioxide and other type fire extinguishers. It answers, with photographs and diagrams, such vital questions as: "What type fire hazards should I recognize?"; "How can I mobilize my employee fire defense?";

Mac's FASHION LACQUER PASTE FILLERS

RAPID-DRI AND OVER-NITE TYPES

Are specially formulated to withstand lacquer solvents and to prevent shrinkage and grayness.

Rapid-Dri Lacquer Paste Fillers oxidize in three to four hours ready for the regular finishing schedule. The Over-Nite type oxidize more slowly. They give excellent adhesion and provide a good foundation for the finish.

Available in all shades of mahogany, walnut and oak—also natural.

Write for new descriptive folder just off the press.

The Lawrence-McFadden Co.

Headquarters for Fine Finishes Since 1875

7430 STATE ROAD **PHILADELPHIA 36, PA.**

CEL-U-LAK No. 5354

Fast drying, clear protective film for metal surfaces

5354 CEL-U-LAK gives a thin, colorless, tough adherent film of great resistance to rust and tarnish . . . Widely used for tools, hardware, sporting goods, lighting fixtures, etc. . . . Can be reduced 100% to 200% and applied by dip or spray.

The Varnish Products Co.

5204 HARVARD AVE. **CLEVELAND, OHIO**

"What is the correct spacing and bracketing height for various type fire extinguishers?"; "What are the approved methods of operation for carbon dioxide, soda-acid, foam, pump tank and carbon tetrachloride extinguishers?"

To obtain your free copies simply write for catalog R-5827 "Fire Protection Handbook," Randolph Laboratories, 8 E. Kinzie St., Chicago 11, Illinois.

Booklet on Organic Coating

The Liquid Plastics Division of Ferro Enamel Corp., 4150 E. 56th St., Cleveland 5, Ohio, announces the publication on August 15th of a booklet, "Review of Product Finishing with Organic Coatings." The booklet is educational in nature, and chapter headings include the following: Metal Preparation for Organic Finishing; The Importance of Metal Preparation; Control of Organic Finishing Materials and Application; Accelerated Testing of Organic Coatings; Selection of Organic Coatings for Product Finishes. Copies of booklet are available free to interested companies.

New Cleaning Handbook

The Phillips Chemical Co., 3400 Touhy Ave., Chicago 45, Ill., manufacturer of production line cleaning compounds and industrial maintenance compounds, announces publication of its new handbook on "Production and Maintenance Cleaning." This gives complete information on proper methods and compounds for use in every type of production line cleaning as well as maintenance cleaning, bound in a handy, pocket size booklet.

Included are recommendations for alkali cleaners, electrolytic cleaners, emulsion cleaners, paint and enamel removers, rust removers, carbon removers, bright-dips, burn off and vapor solvent degreasing.

In addition, proper compounds and dilutions are recommended for every type of maintenance cleaning, such as hand soap, floor cleaner, steam cleaner, carbon remover, rust remover, drain cleaner and many others with special applications.

Gilbert Spruance Co. Expands

The Gilbert Spruance Co., Philadelphia, Penna., announces that a contract has been awarded for a new building to double the capacity of its stains and fillers production, to meet the increasing demands of customers.

Also, work has been started on the enlargement of the company's lacquer warehouse, to increase storage facilities, thus enabling the firm to carry more finished goods in stock and offer better service to the industrial trade.

McCracken Joins Detrex

Detrex Corporation, Detroit, Mich., announces the appointment of Dr. William L. McCracken, recently discharged from the U. S. Army Engineers with the rank of lieutenant colonel, to the position of administrative assistant to C. F. Dinley, Sr., vice president in charge of research and engineering.

Dr. McCracken's new duties will provide both administrative and technical assistance to Mr. Dinley in research and product development in all of the company's three major divisions: industrial metal cleaning, drycleaning, and oil-extraction.

Save Yourself From Fire Loss

One thousand dollars worth of valuable property is being burned up in the United States every minute of the day at the present unprecedented rate of burning, according to the National Fire Protection Association, which announces that Fire Prevention Week will be set by proclamation of the President of the United States and Governor General of Canada as the week of October 6 to 12. According to the NFPA, sponsors of Fire Prevention Week, fire losses in the United States for the 12-month period ending June 30, 1946, were $519,244,000 as against $442,877,000 for the previous 12-month period.

Rudd Lacquer Corp. in New North Carolina Factory

The Rudd Lacquer Corp. has completed three months of business in a new fireproof plant located in an industrial section of Asheville, N. C. The building, 100-ft. square, is especially designed for the manufacture of wood finishing materials. A private railroad siding extending the full length of the building, provides convenient railway service, both for delivery of raw materials, and carload shipments to customers.

A well equipped laboratory and a spacious office provide facilities for handling volume business. The plant has a capacity of turning out 100,000-gallons of lacquers and stains per month.

Since Asheville is centrally located to serve the Carolinas, Tennessee and Georgia, the new company has been given generous support by furniture manufacturers located in its vicinity, and has been frequently complimented on its choice of location.

Mr. J. F. Rudd, President, and Mr. A. G. Spencer, Vice President, have had many years of experience in the wood finishing industry, and are well acquainted with the requirements of the southern furniture manufacturers.

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TRADE MARK

The Perfect Color Blend

- **Accurate Results in one-half the time**
- **One Operation with instant action**
- **Precision Uniformity of ingredients**
- **Preserves the grain — new and efficient**
- **No shop should be without them**

APPLY QUALASOLE

1. Apply Qualasole. America's finest padding lacquer with a pad in the conventional manner to the entire defective area. This will provide the correct base and seal for the Match-O-Stain.

APPLY MATCH-O-STAIN

2. Dip the same pad into the correct shade of Match-O-Stain and continue to pad in order to match-up and blend the color as well as to build-up the defective area.

APPLY QUALASOLE

3. A final full padding over the entire surface with Qualasole will give the desired uniformity of finish, accentuate the grain and preserve the wood. For perfect color-blending use Match-O-Stain plus Qualasole.

Match-O-Stain also mixes readily with Shellac, all types of clear Lacquers and Varnishes — Oil — Bronzing Liquids — Japan Drier.

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Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metal-working, woodworking and miscellaneous industrial plants where production cleaning and finishing are major operations in parts and products manufacture.

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Editorial

Your Reputation for Dependable Quality

★ The trend of some manufacturers recently has been to lessen quality and ship merchandise fast and furious, with regard only for today's profit. I have always maintained that when a business is established, it is the object of the originators that this be an ever growing and ever functioning concern, and that plans and policies should be made for the years of future survival in mind. Men may come and men may pass away, but the business must be constantly alive after its originators have served their term.

Is your firm living only for today, or are you always building and creating good-will for your firm and beauty for the nation? If your answer is "yes," then watch the quality of your products. Do all you can to maintain honest quality and preserve a reputation for reliable merchandise.—N. A.

Getting Along With Your Workers

★ It has been my pleasure to come into frequent contact with an executive of a firm located in Chicago. Through watching him and studying his various activities, I could never understand where he got such limitless energy for doing his employees good. For many years he has had a finishing department consisting of about 30 sprayers, 10 dip-coaters, and all the other personnel needed to keep his production moving. Recently he increased this production force by over 50%. His former employees averaged anywhere from 10 to 20 years in steady service, although his plant has been in operation about 26 years. *(Cont'd p. 122)*

★ Guest Editorial . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

THE FINISHING TOUCH TO PRODUCT

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FERBERT-SCHORNDORFER F-S CO.

CLEVELAND, OHIO

This is an enviable record in the finishing industry and one which shows that it is possible to do great things with the help of loyal employees. I had been trying to find out the secret of this man's success with labor, although he had one small strike caused by some exceptional condition. One small strike in 26 years is a record in itself today. Accordingly I got myself invited to his home which is located in the same city.

I was amazed to find that this man had a library of hundreds of books relating to human nature, autobiographies, and a multitude of subjects up to date on the wheres and whyfors of men. He read these books and then signed and dated them. Here is a man, whose daily chores bring him in contact with the lowly and the mighty. He has guided an enterprise from a $5.00 bill to an organization doing business all over the world, amounting to millions of dollars annually. Here is the same matter of which you and I are made of—only he does it differently.—A. N.

Another Factor in "Rolling Smoothly"

★ The finishing trades, having started to really get things rolling off the production lines, are to be congratulated for the work they are doing. However, great as it is, the industry has a few cobwebs to clean out. Take, for example, antiquated ideas on management-labor views; and inter-department politics. These two items are among the immediate objects that should be closely checked.

We see and have been seeing too many object lessons of what strikes can do toward harming all concerned. Sometimes it is not easy to avoid this situation; most of the time it is.

Lack of understanding between departments is a predicament found too often in the larger industries. As a result, many operations are done over several times before the product is fit to market. This creates a hole in the efficiency of the firm's original schedules of production which, in turn, cuts down the profits to the company and the morale of the workers involved.

It will take time and thought to try and work out a fair solution to these local conditions. A square shooting management will get down to the business of tackling these problems right now. This type of management will also get results, right now. As for executives who still think in terms of "tomorrow," here's hoping you don't become lost too long, and that you see the light real soon.—N. A.

Keep the Prestige You Have Earned

★ Emphasis on finishing work in the future will center around beauty, attractiveness, and eye-appeal. Customers will see to that. And the alert leaders in finishing plants or departments must realize that their profits will come from following the buying trend.

Does this mean that buyers will lose interest in quality, utility, and durability when they consider finishes? No. These points are just as important as ever. But there is this difference: Customers now take them for granted. When he buys a new product, the buyer assumes that these practical considerations have received proper at-

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for Finish Resistance

Qualavite 100E is the modern finishing coat-of-armor. It positively resists the age-old destructive elements—alcohol, water, moderate heat, abrasion, impact and will not scratch white seven days after application. It is hard and retains its flexibility and resistance indefinitely. Qualavite 100E, the clear resistant lacquer, will give the protective finish necessary for present-day sales appeal.

Write for quotations.

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QUALATONE PRODUCTS INCORPORATED

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SAVINGS up to 25%
of your Finishing Cost!

with a G. M. No. 5 PRESSURE SPRAY GUN

Patented Nozzle Reduces 25% Mist and Saves Paint

Better atomization, greater speed, G. M. Gun lays material more uniformly on object. Excess mist eliminated; paint saved. Patented nozzle with combination of external and internal atomization gives double breakage; finer atomization. From ⅛-in. to full wet 14-in. fan spray. Very moderate price. For details write Dept. L.

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PLANT LAYOUT and PRODUCTION ANALYSIS
Winston-Salem, N. C.

tention, and that he may turn his judgment entirely on the appearance and good looks of the finish.

This represents a great advance for the whole field of industrial finishing. It means that, in relatively few years, the public has given its approval to a wide variety of finishes and finishing materials. Seldom has "customer acceptance" come so swiftly to any major industry or business.

With this opportunity for the future, there goes a responsibility as well. Every person engaged in such work owes it to the public to maintain the high quality of materials and workmanship which has pushed the industry ahead so rapidly. For this faith among buyers could be lost in a short time if finishers forget basic quality while trying to achieve too many novelty effects in advance of the times.

Just as long as the finishing plant or department keeps constant check on the quality angle, the customer can judge his purchases solely on how attractive the products seem to him. His confidence in the fundamental quality puts added opportunity in the hands of the finisher who now becomes a leading factor in creating sales.

The future must bring changes and improvements. But every move must be considered first from this standpoint: How will it effect the prestige and "customer acceptance" you have helped earn for the industry?—G. M.

New Horizons in Furniture Production

★ The wood furniture and cabinet industry is now undergoing a radical change which is unprecedented, and has no similar past record.

With the return of G.I.'s, and many practical furniture men setting out on their own, some of the old time established firms are finding unorthodox competition which was never contemplated.

Certainly the war is the primary cause of this upheaval in the furniture and cabinet industry. The results will be a better product, a young stimulus, and an added impetus that is vitally needed.

The furniture industry has lagged behind the rest of the nation's industries in equipment, engineering and general progress. New blood, new ideas, and the ingenious amateur approach that is distinctively American is, in effect, the "Renaissance" of the furniture world.

Many of the far traveled beginners have seen the technocracy of wood that rules a steelless economy on foreign shores. They have seen the studies that wood-minded countries have made, and they have learned just enough to try it over here.

Yet, in spite of this slightly rosy picture, the dangers are great. Too many G.I.'s have been sold on the high profits of the furniture industry. Instead of learning they are eager to be "boss." Many are doomed to fail, and with them a host of creditors are bound to suffer.

Is the answer to this problem to insist upon no credit? No. Our country was founded on the idea of pioneering and staking the newcomer. This does not mean giving unlimited credit, but it means extending a helping hand to the newcomer; giving him a break and guiding him from dangers and pitfalls.

While many of the new small outfits are bound to close up, their

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Eliminate
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Sturdy, properly-constructed baskets in a variety of sizes and shapes, and of metals and alloys to meet all requirements.
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The TABER ABRASER is easy to operate ... gives a permanent, accurate rating

It enables you to determine in advance the inherent surface wearability of paints, lacquers, plating, textile, leather, rubber, metals and many other materials.

YOURS on request — Manual explaining fully the Taber Method and the reasons why it pays to pre-test. (Also included—brochure on stiffness and resilience testing with the Taber V-5 Stiffness Gauge.)

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The Taber Test Proves What Wears Best

Remove.. PRODUCTION LINE DUST · LINT and SAND PARTICLES

MAKE YOUR FINISH SPARKLE

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Speed Up Your FINISHING PRODUCTION LINE with this Soft Tacky Cloth

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losses will be held to a minimum; the ones that succeed can be developed into good repeat business. American pioneering of the wilderness may be over, but Americans pioneering in business is ever recurrent. That is what has kept America enterprising and ever alert to progress.—JOSEPH HALPERIN.

Pre-Tested Special Product Finishes

THE PROTECTIVE and decorative coatings that help to make thousands of articles sanitary, beautiful and durable are highly specialized products made possible by constant chemical research. Many people, to whom such coatings are just plain paints, varnishes, or lacquers, do not realize that they are really scientifically formulated special finishes made to suit specific types of service.

The various requirements are so numerous and ever-increasing that a single manufacturer of specialized production finishes may have developed thousands of formulas in his experience; and find it necessary to develop still more to meet new and changing requirements. Those firms in the paint, varnish and lacquer industry who make specialized production finishes maintain extensive laboratories, specially constructed and equipped with the most modern scientific appliances for the development of their finishes. These laboratories are staffed by chemists and other technicians.

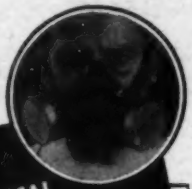
Sometimes, in the development of a finish required to meet some special need, a year or more of research with hundreds of trial

and error experiments, may be necessary to achieve a formula that is satisfactory. The finish on a refrigerator, washing machine, or other article coated with a special finish was not merely painted, varnished or enameled by a manufacturer who just picked out the right can of finish from a shelf of ready-made products. It is a coating that has a long expensive record of chemical research behind it.

Requirements for specialized product finishes involve many factors which would be negligible and wholly unnecessary in the coatings used on ordinary construction and for general home purposes. For example, they may necessitate resistance to certain specified acids, or gasses, bending, scratching, humidity, mildew, and extremes of the arctic and tropical climatic conditions, with specified degrees of hardness, toughness, elasticity, hiding power, tint retention under highly adverse conditions, light reflectance, and—added to all the utilitarian requirements—beauty.

For example, consider the finish on a modern refrigerator. One manufacturer of specialized product finishes, in listing some of the problems in producing finishes for refrigerators, points out that one finish for that purpose is tested 48 hours in direct contact with lemon juice, for 120 hours in contact with butter fat, 120 hours contact with mayonnaise, 48 hours direct contact with vinegar, 120 hours contact with lard, and three months contact with mustard, with controlled temperatures to determine resistance to staining and other factors. Similar tests are made to determine resistance of the finish to various cleaning materials.

APPROVED FOR ORGANIC VAPORS



The NEW M·S·A CHEMICAL CARTRIDGE RESPIRATOR

OFFICIALLY APPROVED BY THE U. S. BUREAU OF MINES

This new M.S.A. Respirator provides respiratory safety for industrial finishers against harmful paint spray vapors, degreasing solvents, paint removers, etc. New floating cushion facepiece assures easy comfort; flat exhalation valve lessens breathing resistance; chemical cartridges are quickly replaceable. Write for details!

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BRADDOCK, THOMAS AND MEADE STS.
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GRAINING PLATES
for
Improved Appearance

AMERICAN RICHWOOD PRODUCTS CO.
Graining Plate Division
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We will purchase and/or have reclaimed paint overspray from water curtained spray booths. Any type paint, enamel or lacquer is acceptable.

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MIRACLE

5 Gallon
BLUE
BOY
Model

PAINT REJUVENATOR

Restores Paints, Lacquers, Enamel Products and Pigment Primers, to original consistency in 3 to 10 minutes without opening the can. Available for Round or Square 5-gallon cans. Explosion proof electrical equipment if desired. Also other units from ¼-pint to 50-gallon drum capacity available. Originators of Paint Rejuvenating Equipment—ten years—thousands of satisfied users.

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Grueling Tests for Hardness and Adhesion

When it comes to tests for hardness and adhesion, some industrial production finishes are subject to abuse to which paints, varnishes and enamels used in ordinary construction would seldom, if ever, be subjected. For example, in a test of a specialized product finish to meet certain specifications for surface hardness, it is stated that it is only with extreme pressure that the sharp cutting edge of a special instrument is made to penetrate the film; and then it tends to ride up back over the surface, indicating absence of any tendency to de-laminate. Sharp hammer blows are applied on both sides of a rigid panel and must not crack or chip the finish.

In one test for adhesion, a glass jar weighted with 600 grams of ball bearings and shot rides back and forth across specially surfaced board. Each complete stroke of this service-type abrasion test is recorded by an automatic counter. It is stated that as many as 57,000 strokes have been applied to a specified finish with little effect.

Salt Spray and Ultra-Violet Light Test

Other of the hundreds of different kinds of tests involved in the manufacture of specialized production finishes include salt spray and ultra-violet tests. In testing with ultra-violet light, a portion of each panel is covered, to provide a means of comparison at the end of a test. Tests are also made by exposing duplicate panels to direct light, with their counterparts enclosed in dark cabinets to insure good appearance and freedom from graying or yellowing with age. *(Continued on page 132)*

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NEW TYPE *Dual Strand* CONVEYOR OFFERS 5 BIG ADVANTAGES

TO meet popular demand, Jensen has developed a new type Dual Strand Roller Chain Conveyor that gives these advantages:

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2. Simple construction . . . maintenance costs virtually negligible.
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4. Flexible design . . . adaptable to almost any function, light or heavy duty.
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OLD FRIENDS ARE BEST!
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C. RAYMOND SYER
Consulting Finishing Industrial Engineer
P. O. Box 31 Westport, Conn.

In testing with salt spray, one test involved more than three months of constant exposure to 20% salt spray at 95° F. and failed to make an impression on the finish.

The forgoing are only a few examples of the complexities involved in the production of specialized product finishes, some of which are prepared to be baked on to the surface for which they are intended and others to be applied without baking, but at controlled temperatures.—N. P. V. & L. A.

Check up All Fire Extinguishers

NEWLY acquired extingushers supplied by sources other than the manufacturers or their authorized agents should be thoroughly inspected before they are put into service. Make sure that they are in operating condition. Those that show evidence of mishandling or deterioration may be dangerous to the user and may not function properly when needed. They should be reconditioned only by the manufacturer whose nameplate they bear.

The extinguisher shell, particularly in the case of soda acid and foam types, should be examined for dents caused by falls and for signs of weakening at the seams. Bulges in the shell indicate that the unit has been subjected to freezing or insufficient venting of pressure. Evidence of soldering or other makeshift repairs are also indications that the extinguisher may not be safe for use. Soda acid and foam extinguishers should be checked on hydrostatic testing equipment for their ability to withstand pressure to 350-lbs. Rubber hose should be examined for cracks or loss of flexibility, especially where substandard extinguishers bearing EAS approval are concerned. Made during the war, these "Emergency Approved" models were constructed of substitute materials which are subject to rapid deterioration. Porcelain enamel coatings used on interior parts of EAS pump tanks

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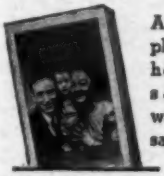

A booklet for employees. Explains how the payroll savings plan works . . . goals to save for.

OFFICIAL APPOINTMENT—

The person appointed Savings Bond Officer for his organization is entitled to display this certificate of identification.

OFFICIAL COMMENDATION—

A certificate of commendation by the U. S. Treasury for every company operating the payroll savings plan. You can display it proudly.

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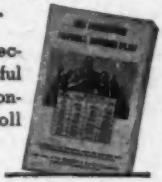

A booklet for key executives. Contains helpful suggestions on the conduct of your payroll savings plan.

IF you're not already using these helps to a healthy future, get in touch with your State Director of the Treasury Department Savings Bonds Division. Keep up your payroll savings plan. It builds security for all!

The Treasury Department acknowledges with appreciation the publication of this message by

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Designers Manufacturers of
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CLEVELAND 9 OHIO

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North American Electric Lamp Co.
1030 Tyler St. St. Louis 6, Mo.

and foam extinguishers, should be inspected for cracks.

Carbon dioxide extinguishers should be examined for corrosion, damage to the horn, clogging of the discharge nozzle, and damage to the valve. The extinguisher should be weighed to make sure the valve is still gastight. The cylinder should be subjected to hydrostatic test for its ability to withstand pressure to 3000-lbs.—SAFETY RESEARCH INSTITUTE.

Background of Errors

★ The finishing department has more than its share of places to make errors. Even with experienced workers there are some mistakes and the trouble increases with labor turnover. But the foreman should remember this point: In handling an error in procedure or technique, he must be careful that he does not create a bigger mistake in employee relations.

Learn to study the background of errors before placing any personal blame. Was the worker's training period long enough to give him knowledge of the task and practical efficiency too? Did poor equipment, faulty ventilation insufficient lighting, or similar factors contribute to the error? Had the worker been on duty too many hours in the finishing department? (Overtime pay doesn't eliminate fatigue and the tired-out feeling that leads to many mistakes, both of judgment and of action.) Were there earlier signs that this person should be transferred to other work? Finally, was the foreman himself partly at fault because his critical attitude made the employee feel ill at ease?

When the foreman carries out his investigation along these lines he generally comes to the conclusion that few mistakes are the sole responsibility of a single man in the department. Having reached this point, he is now ready to consider the personal angles in an impartial and cool-headed manner. Thus he places on his helpers only the share of blame to which they are entitled. Best of all, he finds this method keeps little errors of procedure from developing into big errors of management.—G. M. DODSON.

TWENTY-SECOND YEAR OF PUBLICATION

Industrial FINISHING

W. H. ROHR, Editor P. C. BARDIN, Associate Editor

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By Lawrence H. Singer

Shakeout Coming—A stern warning about the promiscuous franchising of new dealers in the electrical appliance field is sounded in a New York *Times* survey. This unhealthy tendency is attributed almost exclusively to war-born, fly-by-night manufacturers who are apparently convinced that the superior production and merchandising facilities of old-established producers will force them out of business once competition returns.

As a consequence of this understandable fear, these transitory manufacturers seem anxious to unload their products on almost anybody who will buy them, giving little thought to permanent marketing considerations. In sharp contrast with this development, one of the nation's largest appliance manufacturers states that its dealers are at the identical numerical level maintained in 1941; the only new dealers they have taken on are replacements for the wartime "casualties."

Among the recognized appliance manufacturers, there appears to be a definite policy of declining to establish new retail outlets until supply conditions improve. Some returning veterans are being granted franchises, but in every case adequate proof of sound financing and business experience is being emphasized.

* * *

Chilling Disclosure—Here is a thought to disturb your slumber: According to the McGraw-Hill publications, the atomic bomb is by far the cheapest method of destruction ever devised by man's genius!

This report reveals that atomic bombs can be manufactured and delivered for less than $500,000 per square mile of destruction. It points out the fallacy in underscoring the two-billion dollar cost of our atom bomb plants during the war to deliver only two bombs that were dropped on the enemy. New plants can be built at a fraction of wartime cost, and the investment may be spread over thousands of bombs.

* * *

Rust Preventative—It has been estimated that corrosion of underground gasoline, oil, water and other pipes costs the United States 200 million dollars annually. The Dow Chemical Co. recently revealed a relatively simple method of preventing this enormous waste.

The new technique involves the use of buried rods of magnesium, which are more susceptible than pipe metal to corrosive influence. As a result, the magnesium takes the punishment, and the rods can be replaced at a fraction of the cost of piping.

If the company's hopes are justified, the use of magnesium rods will be extended to many other types of metal structures—such as underground tanks, steel piling, and lead sheath cables. It is even

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Manufacturers of modern wood and metal finishes since 1907.

contended that this protection may eventually be extended to ship bottoms.

* * *

Catching Up — Only a few months ago, deliveries of fractional horsepower motors were as much as two years behind. However, leading industry spokesmen seem to feel that many orders have been duplications, and that the coming months will bring numerous cancellations as the volume of shipments increases.

In the view of William Maxson, chairman of the board of Victor Electric Products, Inc., production in the second half of 1946 should average about 30% higher than in the first six months of the year. Raw material prospects in this field are generally improving, despite the fact that steel producers are refusing to take orders for the balance of 1946.

* * *

Fire Control—A newsworthy development in fire detection has been announced in *Electronics* Magazine. It is a ray-catching tube that is capable of recording a match flame 60-ft. away in broad daylight.

The trouble with most fire alarms, it is pointed out, is that they are set off by heat, and generally a blaze is well under way by the time the warning has been received. This new development, perfected by Paul B. Weisz of the Socony-Vacuum Oil Co., is expected to be used first in airplanes, in order to give warning of flaming motors. Numerous other industrial applications will undoubtedly come later.

* * *

Another New Car—The latest entry into the auto field is the Tucker Torpedo, a vehicle which will in-

clude some radical engineering ideas. There will be a rear engine of aluminum casting, with cylinder walls of fused bronze.

Other innovations include independent suspension on all four wheels, aircraft disc-type brakes, and a 24-volt electrical system. The Tucker Torpedo is to have a 6-cylinder engine rated at 150-hp., and there will be no transmission or clutch. An added attraction will be headlights on the front fenders which will turn with the wheels.

* * *

Market Fading?—One of the hotly debated questions of the day is the real size of the auto market. A sober view of the situation is offered by Don E. Bathrick, general sales manager of Pontiac.

"By spring there should be a full blossoming of the competitive market," he declares, "and salesmen and selling efforts will have to come to life before this occurs —or a lot of businesses are going to be trampled in the rush."

Bathrick contends that not more than 50% of the orders now on dealers' books will be delivered, because of duplications and the diversion of the customers' money to other pressing needs. He tells a story of one man who had orders placed with eleven dealers. When one car was delivered to him, ten cancellations followed quickly.

* * *

Negligible Market — Many writers and business men have been forecasting the approach of an enormous volume of trade between the United States and the Middle East. In sharp contrast, Maj. Gen. Russell L. Maxwell, former head of the Office of Adminstrative Ex-

(Continued on page 105)

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CLEARFLEX—high grade air dry lacquer with exceptional adhesion to glass. Fast-drying, durable, resistant to cracking, blistering, peeling.

CRYSTALCOTE—standard, all-weather finish for transportation equipment. Protects against sun, snow, ice and salt-air. Withstands worst possible weather and road conditions. Retains its beauty and rich color indefinitely.

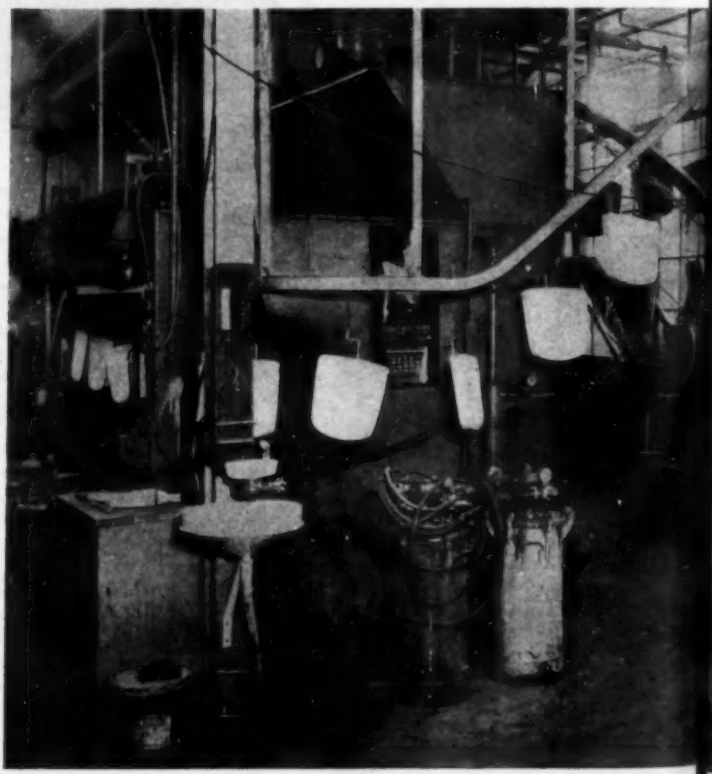
"A Symbol of Quality *in the Finishing Field"*

Cleaning and Finishing

Noblitt Sparks Industries' setup for cleaning and spray coating the table tops, chair seats and backs of modern chrome trimmed dinette sets.

MODERN easy-to-keep-clean metal furniture requires a smooth enduring finish. The coating must have toughness, durability and attractiveness—and it must be acid and alcohol proof. The time and cost involved in preparing surfaces for the finish, and

This typical view shows how parts move through the spray booths by overhead conveyor.



Metal Dinette Furniture

the application and curing of the finish are also vitally important factors.

It was with all of these things in mind that we planned our finishing system—including the equipment and materials needed for finishing dinette furniture. A dinette set consists of an extension table with

BY R. C. ROOT
Engineer

12-in. leaf, top and leaf in red or white, black understructure, chrome legs and trim; and four chairs. Chair backs are white with either red or black seats, chrome legs and back frame.

Four Overhead Chain Conveyor Lines

The equipment consists of four separate, continuous, overhead monorail conveyors which are designated as A, B, C and D in Fig. 1, a metal cleaning and Bonderizing unit, insulated drier oven (elevated, with connecting enclosed tunnel); five water-wall spray booths and an insulated bake oven through which all conveyors pass on two levels. Both drier and bake ovens are equipped with oil burners, circulating fans and an exhaust duct system. All air that enters the bake oven is filtered.

Table tops and leaves, chair backs and seats are delivered from the fabrication department to the finishing room on the parts-cleaning and prime conveyor A, which travels at a speed of 18-ft. per minute. The metal cleaning and Bonderizing unit is a 3-stage washer with spray nozzles mounted on 12-in. centers on each side of the tunnel, as shown in typical section Fig. 2. These sprays operate on an air pressure of 15-lbs.

All rinse tunnels have an overflow. Alkali, Bonderite and chromic acid tunnels have circu-

lating pumps, sloping bottoms and clean-out doors. Alkali and chromic acid solutions are titrated hourly, concentrates being added as needed to maintain strength and solution levels. The Bonderite solution level is maintained by drawing from the contents of any one of three drums which are mounted on a projecting base of the tunnel. Each drum is fitted with a measuring valve.

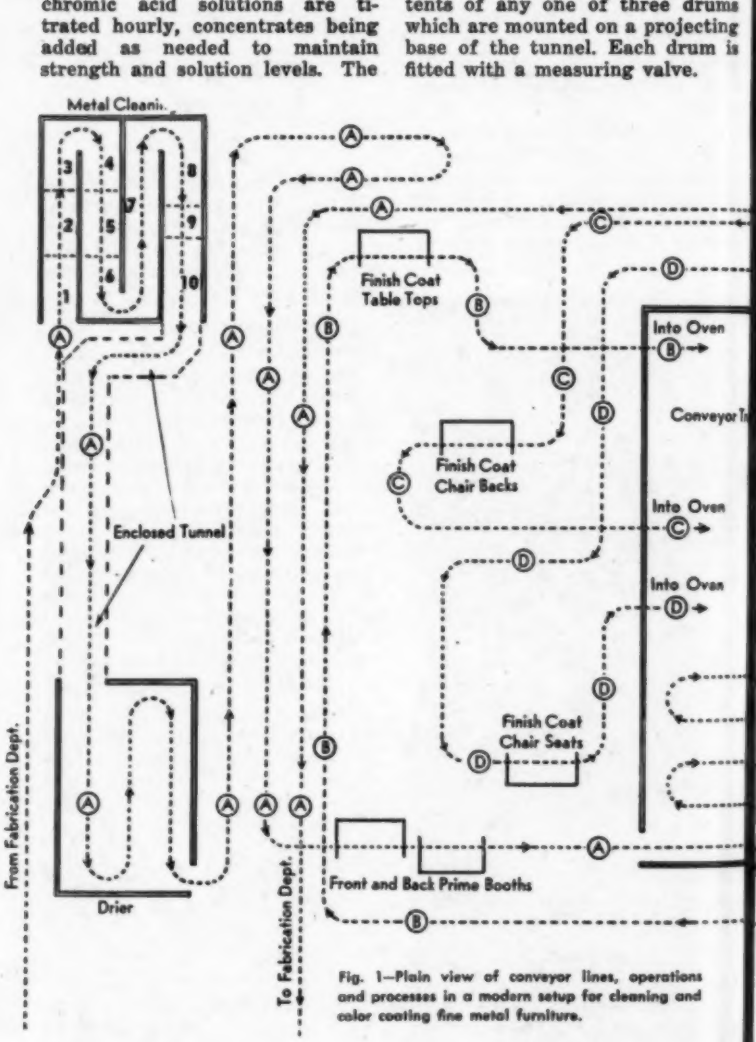


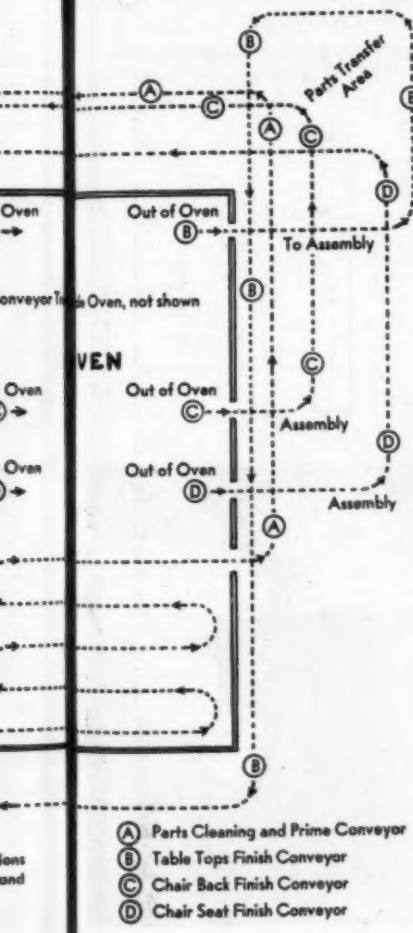
Fig. 1—Plain view of conveyor lines, operations and processes in a modern setup for cleaning and color coating fine metal furniture.

Through the 10-stage Cleaning-Bonderizing Setup

Referring to Fig. 1, upper left hand corner, parts hanging from an overhead conveyor enter the first stage (No.1) of the washer where a hot alkali cleaning solution (1/3-oz. per gallon of water, 180° F.) is sprayed against them. Time, ¾-minute. Next comes (2) treatment by an alkali solution which is heated to 160° F. Time, ½-minute, (3) Alkali solution and emulsion at 130° F. Time ¾-minute. The use of emulsion in the third stage prepares the metal for a smoother Bonderizing job. (4) First rinse at 150° F. (5) Second rinse at 130° F. (6) Third rinse at 100° F.

Total time for three rinses is two minutes. Temperature is dropped from 150° F. to 100° F. to prevent quick drying of parts. The metal surfaces must be quite wet when Bonderite is sprayed on. (7) Bonderite (15-point solution) is sprayed on through stainless steel nozzles at 120° F. Time, one minute. (8) Cold water rinse. Time, ½-minute. (9) Dry tunnel space to permit parts to drain. Time, ¼-minute. (10) Chromic acid at 170° F. Time, ½-minute.

Connected to the outfeed end of the washer is an enclosed, insulated tunnel through which the clean Bonderized parts travel to the drier oven. This tunnel is not direct fired; it receives its heat from the drier oven and serves to pre-dry the parts before they enter the drier oven, which is operated at 300° F. Total drying time, 7½-minutes.



Prime Coating; Then Transfer To Other Conveyor Lines

Still traveling on conveyor A at 18-ft. per minute, parts in process follow a circuitous route at room temperature for 10 minutes. During this time they become cool before entering the two prime-coat spray booths where fronts and backs are coated with cream-colored synthetic-base material.

A 4-minute flow-out time is allowed before the parts enter the bake oven where they remain in motion for 30 minutes at 300° F. After leaving the bake oven, the parts cool as they travel to the transfer area (upper right in Fig. 1) where the four conveyor lines intersect at different levels. As parts are removed from conveyor A they are carefully inspected. Table tops and leaves are transferred to conveyor B; chair backs go onto conveyor C, and chair seats are put on conveyor D. Conveyor B operates at a speed of 12-ft. per minute; conveyors C and D travel at 8-ft. per minute.

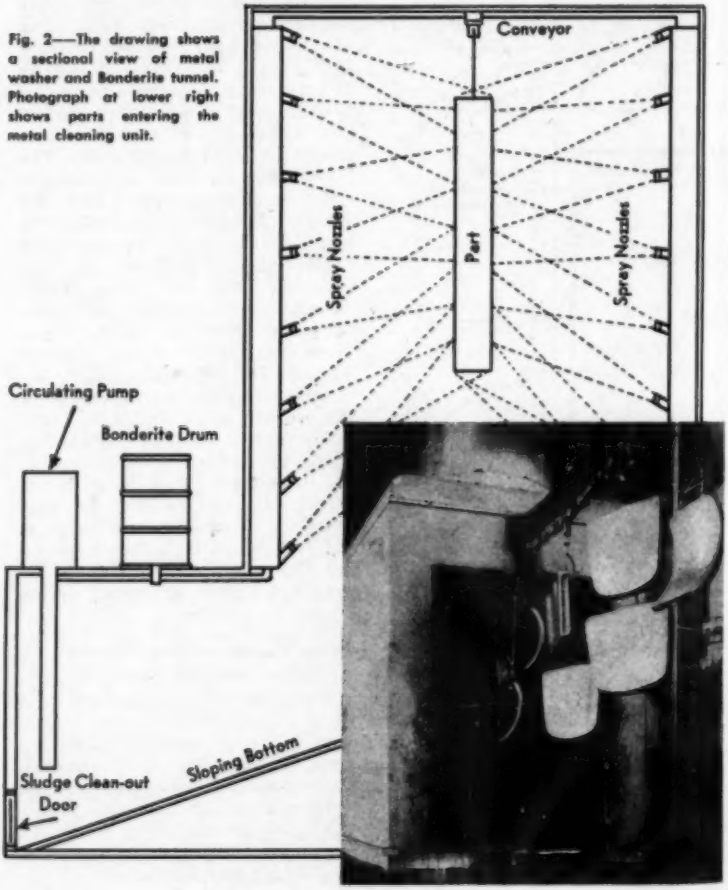


Fig. 2—The drawing shows a sectional view of metal washer and Bonderite tunnel. Photograph at lower right shows parts entering the metal cleaning unit.

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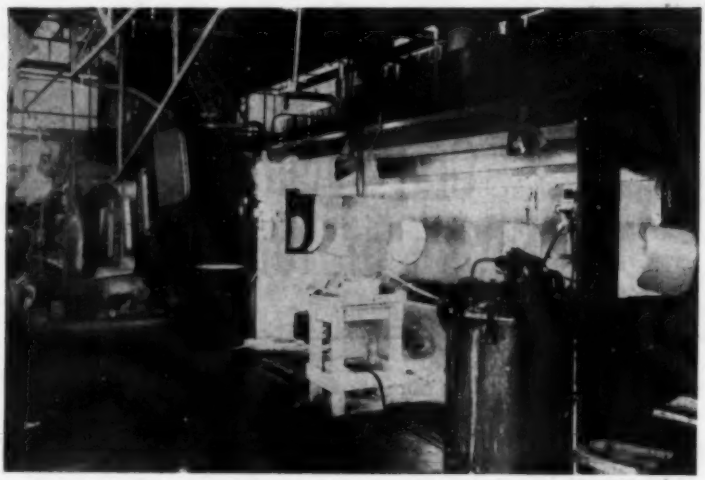

Another view of overhead conveyor line where it passes through water wash spray booths.

Each conveyor line follows the courses indicated in Fig. 1, to reach and pass through the various spray booths where a top coat of synthetic enamel is applied. We have found the following schedule of pressures most satisfactory in spraying synthetic enamels: For table tops—pressure at material tank, 15-lbs.; air pressure at gun, 65-lbs. For chair backs—pressure at material tank 15-lbs.; air pressure at spray gun, 75-lbs. For chair seats—pressure at material tank (for red) 25-lbs.; for black, 18-lbs.; air pressure at spray gun, 75-lbs.

From four to six minutes flow-out time elapses after spray coating at the various spray booths before the coated parts enter the bake oven where they receive a 30-minute bake at 300° F. After leaving the bake oven, a 15-minute cooling period follows as the parts travel on the respective conveyors to the assembly lines. Final inspection of the various parts is made as they are removed from the conveyors.

For simplification in Fig. 1, I have omitted the understructure line. This conveyor line, operating at a speed of 7-ft. per minute, carries these parts from fabrication to a cleaning tank containing petroleum cleaner. It is located in front of the drier oven (lower left, Fig. 1.). Parts then pass through the drier and to an elevated dip tank and drain pans (in back of prime booths) where they receive a dip coat of black synthetic enamel. This is followed by a 10-minute bake at 300° F., followed by cooling as the understructure parts travel to the assembly room. This conveyor line is fully automatic. Dipping parts into the cleaner and enamel is accomplished by depressing the conveyor at these two stations.

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AMBLER ACP PENNA.

I am submitting an article for your approval, based upon a problem that recently presented itself and caused a great deal of difficulty in production. I hope this article meets with your approval.—

Seymour Wattenberg

Stop Paint Blisters on Aluminum Castings

BY SEYMOUR WATTENBERG

Chemist with
Manning, Maxwell & Moore, Inc.

THE POROSITY OF aluminum sand castings presents a problem in the application of baked enamel finishes. When these castings are coated with a primer or an enamel and then baked, many blisters often form in the coating.

What Causes Blisters in Baked Finish on Aluminum

A probable explanation of the cause of these blisters can be that the numerous pores, air pockets, and small surface defects in such castings allow air to be trapped either within the casting or directly beneath the coating material. When the coating is baked, this trapped air (or possibly other gasses) expands, and thereby causes blisters to form in the coating material.

If the tiny holes are sufficiently large, a thin paint or coating material may flow into them. However, if the holes are too small or the coating material is too heavy, the paint will "bridge" over them. Later, when that entrapped air is expanded by heat, this bridged film forms a blister. When the baking cycle is completed and the metal casting cools, some of the blisters will collapse. This might be partially explained by the fact that as the air (forming the blister) cools, it contracts causing the blister to collapse due to the vacuum created.

The method that was found to eliminate this blistering condition, is to sandblast the castings prior to applying the organic coating.

An Example of Processing Where Blistering Occurred

A typical example of such a condition occurred in finishing recorder instrument cases made up of a case having a hinged front door panel. (These parts are aluminum

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sand castings composed of Alco Alloy 112 or 212.) To obtain a well-fitted assembly (door panel to case), the parts are first disc ground, followed by polishing with No. 70 and then No. 120 grit emery wheels. The cases and door panels are then cleaned and sprayed with one coat of baking primer.

When parts are removed from the oven, after baking at 300° F. for 30 minutes, they generally have a great many blisters. These blisters have to be broken open, sanded smooth, and puttied. At the same time any large holes, scratches or surface imperfections are also puttied. After allowing the putty to air dry for an hour or so, the parts are again baked and sanded.

Entrapped Air Caused Repeated Blistering

Due to the great amounts of trapped air in the castings at times, repeated blistering occurs when subsequent coats of primer or enamel are applied. The number of cycles required to obtain a blister-free undercoat cannot generally be determined, because it varies with the condition of the aluminum castings.

When a blister-free undercoat is finally obtained, it is sanded smooth with a No. 280 grit sandpaper, and the topcoat, a white baking enamel, is applied and baked at 250° to 300° F. for 60 to 30 minutes (time varying with temperature used). If this final coat does not blister, the case is finished. However, if it does blister the surface has to be again puttied, sanded, recoated and rebaked.

This indefinite, long and costly finishing cycle is due to the quality of aluminum castings received. The more porous the metal castings, the more difficult and costly it is to produce a satisfactory finish. Different types of metal castings would vary the finishing cycle; however, changing the type of casting is dependent upon availability and cost.

In attempting to eliminate the blistering on aluminum sand cast-

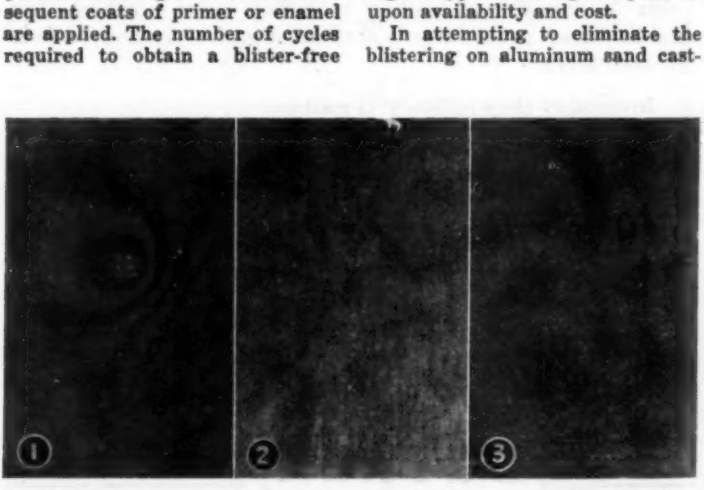

Fig. 1—Original appearance of cast aluminum panels before spray painting No. 1 was disc-ground; No. 2 was disc-ground and polished with No. 70 emery; No. 3 was sandblasted.

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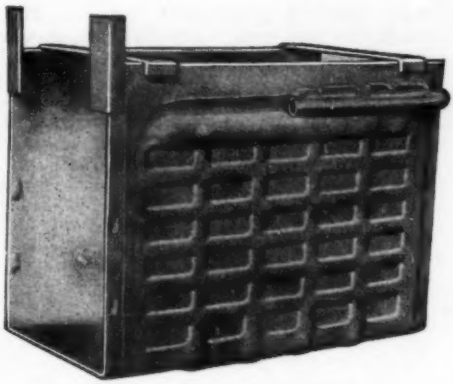

This new baked finish, virtually liquid glass, has extremely high resistance to corrosion, abrasion and impact—making it an ideal protective finish for surfaces exposed to dampness, mild alkalis, gas fumes. As it also withstands heat up to 1000° F., it will materially increase the life of auto exhaust pipes and mufflers, blowers, unit heaters and similar articles. It may be had in soft eggshell matte finishes of ANY DESIRED COLOR. SILCO is also a decorative-type finish suitable for such items as electric irons, toasters, and has many other household and industrial uses where appearance and durability are prime factors.

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ings, different approaches were tried. The first was to try sealing the surface of the porous casting. The second was to vary the surface finish and preparation.

Due to the nature of the parts and to cost reasons, the immersion method of sealing these castings was the only one tried. The parts were sealed by immersing them in a sodium silicate solution, and baking for one hour at 250° F.

Fig. 2—Notice the blisters on the upper half of this cast aluminum panel which received one coat of primer, followed by oven drying. The upper half was disc-ground before painting; paint over it blistered. The lower half was sandblasted—no paint blisters.

The second set of tests was based on varying the surface finish and preparation. Panels of castings were disc ground and polished with No. 70 grit emery, and sandblasted, see Fig. 1. These castings were tested both sealed and unsealed.

Fig. 3—Finished panel of cast aluminum—prime coated and baked; sanded; puttied and baked; sanded; enamel top coated; baked.

All of these castings were sprayed with one coat of primer baked at 300° F. for 30 minutes; then wet-sanded with No. 280 sandpaper, and finally sprayed with one coat of enamel and baked at 300° F. for 30 minutes.

In all cases the sealing did not help eliminate or reduce the blistering condition. Blistering occurred on all panels that were disc ground, and disc ground followed by polishing with No. 70 grit emery.

Coatings Over Sandblasted Castings Didn't Blister

The sandblasted panels showed a definite reduction of the number of blisters and, in practically all cases, this pretreatment completely eliminated the blistering. This clearly shown in Fig. 2.

The photograph marked Fig. 3 shows the same panel completely finished.

These tests appear to indicate that sandblasting (or "blast cleaning" as many prefer to call it)

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Mix Metalprep No. 10 with 2 or 3 parts water. Brush on mixture—wipe off with clean dry rags. Satisfaction assured. Order Metalprep No. 10 together with brushes for its use.

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NEILSON CHEMICAL CO.

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tends to break open the pore holes that are near the surface of the aluminum sand castings; and in addition this treatment rounds out the surface structure, thereby removing the causes for the finish to bridge across tiny holes— and therefore it eliminates blistering. When the aluminum sand castings are disc ground or polished, the tiny holes appear to be covered over by the flow of metal, or the size of the holes at the surface is decreased, which helps the finish to bridge across them, and this eventually results in blistering of the finish.

The following conclusions were drawn from these tests:

1) Different aluminum castings have varying degrees of porosity, due either to the quality of metal or method of casting.

2) Aluminum sand castings, when ground, or ground and polished, tend to cause baked organic finishes to blister.

3) *Sandblasting of aluminum sand castings either reduces or completely eliminates the blistering of baked organic finishes.*

Sales Representative Can Help You

BY S. J. TREZAC

"USE HIM . . . and the picture is complete." That was the intriguing, eye-catching caption of a 2-page advertisement published recently in this magazine . . . pointing out that more efficient buying is a key to operating profit.

On the left-hand page appeared in a jigsaw puzzle style picture in which a typical executive, seated at his desk, was looking up at the one missing segment; across on the right-hand page appeared the missing portion, with a picture of a man standing at the door of the executive's office. This picture was held by phantom fingers.

The ad copy went on to say that the company's distributor is a key figure in modern efficient purchasing and offers prompt intelligent service for the user's requirements. "No one is in a better position to give you what you want, how you want it, and when you want it," the message continued, and ended up saying, "next time a . . . representative calls, give him the opportunity to explain more fully the benefits you obtain from dealing with this ideal source of supply. . . . "

I am mentioning this particular ad, not to give its sponsor or his products a free plug, but because it focuses attention on a point that many industrial finishers are prone to overlook or forget—a point that applies to all supplies that are commonly used in modern product-finishing operations.

The point to which I am specifically referring is the helpful advisory technical cooperation that a manufacturer's or distributor's service representative can give to help finishing executives simplify their own particular problems. He is glad to render such construct'ive service; in most cases, that is a fundamental part of his job.

The day of the "order-taker" is on the wane; the day of the "sales engineer" is here. Preferred for sales positions by manufacturers and distributors of finishing methods, machines and materials are men with some technical background. That is because such men quickly grasp and better understand the customer's needs. They

CLEAN-UP MAN *Saves Time* AND MONEY

SUN SPIRITS . . . Replaces Three Other Cleaners,

Costs Less, Cleans Better, Lasts 4 to 5 Times as Long

An Eastern manufacturer formerly used gasoline, kerosene and other materials for cleaning motor parts in the reconditioning shop. Dirt was not completely removed, however, and fumes were both a fire and a health hazard, requiring the installation of hoods.

All troubles were eliminated when Sun Spirits was adopted. Now parts are cleaned more completely. There are no objectionable fumes. The fire hazard is reduced.

Slow evaporation in the cleaning tanks means that Sun Spirits lasts 4 to 5 times as long as carbon tetrachloride, and costs 75% less.

This case is typical of the many plants in which Sun Spirits is used for fast, simple, metal cleaning. There are no dangerous chemicals; no complicated, expensive machines; no need for highly skilled operators. Get in touch with the Sun man for complete data.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***
Sponsors of the Sunoco News-Voice of the Air — Lowell Thomas

SUN
SUNOCO
INDUSTRIAL
PRODUCTS

are in a better position to help the customer solve his particular problem more easily.

It is well to remember, in this connection, that in visiting scores of plants and observing their operations and practices, an alert aggressive supplier's sales and service representative who stays "on the beam" can quickly acquire a "working library" of practical knowledge on finishing processes and problems. This specialized know-how may well give you some facts or ideas applicable to your own work—information that you had not even thought of, and thus lead to the better finishes, time-savings or lower unit costs.

Yes, there is no question that the service representative of a supplier is in a good position to be a big help to you. His services generally are yours merely for the asking. Utilizing them is like adding another specialist or consultant to your technical staff or production crew, but without increasing the payroll.

Don't dismiss salesmen too quickly or too curtly. Give them a chance to tell their story. Listen attentively to what they say and—based on the experience of numerous other plants—it's a more than even bet that you'll be better off.

The right type of sales representative won't try to unload unsuitable merchandise on you. Instead, he will see to it that you order only the most suitable equipment or supplies that will meet your particular processing requirements most effectively and economically. Only by helping you does he help himself!

Use him, and he will go a long way in helping you find the right answers to your finishing problems. Use him, and he can help you expedite and economize on your product-coating or parts-finishing production operations. "Use him, and the picture is complete."

Yarnall Promotes S. C. Mac Knight

The Yarnall Paint Co., Philadelphia, Penna., announces that Mr. S. C. MacKnight has been promoted to the Finishes Division of the Sales Department. Mr. MacKnight joined the company in 1945 upon receiving his honorable discharge from the service. He served 18 months overseas as a First Lieutenant M. A. C. in India, France and Italy.

Paint Technology Studies Included at Case School

Thirty-nine northern Ohio paint firms are cooperating in the establishment of three graduate research fellowships at the Case School of Applied Science to encourage study, research and development work in paint technology, Dr. W. E. Wickenden, President of Case, announced today.

The paint firms have underwritten a fund of $15,000 through the Joint Educational Committee of The Cleveland Paint & Varnish Production Club and The Cleveland Paint, Varnish & Lacquer Association to establish the fellowships for a period of three years, according to Howard E. Wise of The Arco Co., Chairman of the Joint Committee. Other members of the Committee are: Charles H. Reed, The Forbes Varnish Co.; Dwight P. Joyce, The Glidden Co.; George B. Sawyer, The Ferbert-Schorndorfer Co.; Arthur B. Holton, The Sherwin-Williams Co.; and Eugene H. Ott, The Ferbert-Schorndorfer Co.

"The transition which has taken place in paint manufacturing in recent years has made it one of the most highly-specialized segments of the chemical industry," Mr. Wise said. "These changes have placed us on the threshold of new opportunities for scientific development work. The broad sponsorship of these fellowships is an indication of the industry's determination to marshal the most advanced thinking in physics and chemistry for the constant improvement of surface coatings which protect and beautify so many objects in common use."

Dr. Carl F. Prutton, Head of the Department of Chemistry and Chemical Engineering, disclosed that Case is introducing several new senior elective courses in paint technology and is extending its graduate courses to cover basic aspects of the organic coatings industry.

Best FOR FINISHING ALL SURFACES

ON WOOD ON METAL ON PLASTIC

Easy RECIPROCATING ELECTRIC SANDER

WORKMEN PREFER EASY
Because It Makes Their Work EASY

Fast, efficient, light and easy to handle, vibrationless, rugged. Easy cuts finishing costs 50 to 80%. It has been proven best for sanding, rubbing, polishing, scuffing, deburring, "feather-edging", etc. Rapid, straight-line, back and forth, reciprocating action prevents swirls, laps and gouges on CURVED or flat surfaces, WET or dry work. Practical for use by even inexperienced operators on highest quality finish work.

Write for complete details or see your jobber.

DETROIT SURFACING MACHINE CO.

7434 W. DAVISON AVE. **DETROIT 4, MICHIGAN**

Proper Viscosity of Finishing Materials

An essential factor in the success of all finishing and product painting operations is to first find out what the viscosity of lacquer, varnish or paint for that job should be, and then keep the material uniformly at that viscosity.

BY H. W. CHESTER

THE KEEPING OF paints, lacquers, varnishes, enamels, at the proper consistency and viscosity for spraying, dipping or roller coating is of utmost importance in finishing. Not only will this assure top quality work but it will reduce wastage of materials and assure minimum labor costs on the finished product.

Some foreman finishers have a haphazard way of looking after the viscosity of materials they are using. Many of them leave the matter entirely up to their operators. This is wrong, as every operator is almost sure to have a different idea as to what the proper viscosity of a material should be. The result is a loss in both materials and labor, plus a poor finish.

Call on Help from Your Supplier of Materials

The foreman finisher should call on his supplier of finishing materials, and with this expert help he can run tests and experiment with materials of different viscosities, solids, etc., so as to determine the proper type of material and its correct viscosity for each job.

After determining this he can then depend on his supplier of materials to furnish him with just the right consistency of material that he wants.

All suppliers of finishing materials have control laboratories where they keep an accurate and constant check on each barrel or drum of material that leaves their factories. In this way every user is assured of getting materials of uniform consistency.

After the matter of viscosity has been worked out and decided upon, the operators of spray guns, dip tanks, roller coating machines, flow coaters, etc., should not be allowed to tamper with materials that come from the containers.

Some finishers prefer to have certain types of materials come to them unreduced, as there is usually some saving where the finisher reduces the goods himself. In this case he should again work with his supplier of materials to find out just how much each material is to be "cut", so as to have the proper viscosity and solids for this particular job. Then after he has

A-M WHITE SYNTHETIC ENAMELS

Finishing experts count on A-M white synthetic enamels for superior covering, baking-adjustable to plant requirements and simple application (with or without primers). The finish is important to them, too—since they know that American-Marietta technicians and chemists strive to provide not only production economy but also a hard, glossy, mar-resistant finish that will be unaffected by everyday household abuse to stoves, refrigerators, washing machines, cabinets and under-sink cabinets.

A great name in paint making

AMERICAN-MARIETTA CO.

43 EAST OHIO STREET, CHICAGO 11, ILLINOIS

learned this he should use the same formula for reducing all future shipments of that material.

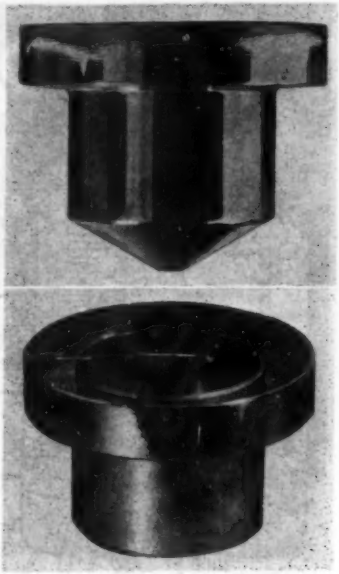
Make Someone Responsible For Checking Viscosity

To make sure that materials are properly prepared and kept at the correct predetermined viscosity, the foreman finisher should designate one man to do the work and then hold that man responsible for keeping the material uniform. There is no reason for different spray operators using materials of different viscosities when they are turning out the same amount and quality of work, using the same air and fluid pressure.

The foreman finisher should also see to it that his spray operators use the proper amount of fluid and air pressure for the materials being sprayed, as the viscosity of materials and speed of spraying are important factors to consider when determining what is best to use in the way of fluid pressure and air pressure. For instance, a viscous material requires more pressure to get it to the spray gun, and more air pressure at the gun nozzle in order to "break up" or atomize the material so that it will flow smoothly. Then too, products moving on a conveyor that carries 75 items an hour will naturally require more material to be sprayed when they are moving at the rate of 50 pieces an hour, hence it will require more fluid pressure and more air pressure.

Material in Dip Tanks Needs Frequent Checking

Where any coating is done in open dip tanks or vats, the viscosity of materials due to more rapid evaporation of solvents, will change every few hours, depending on the type of material used. In order to maintain the proper viscosity, a small sample should be taken at intervals and run through the viscosity cup. This test will quickly show whether or not it is necessary to add thinners—and it can be used to determine just how much thinner needs to be added. After checking and rechecking several times, a set formula which will be fairly accurate can be used for adding thinners—that is if the tank or vat is marked so that at certain marks the quantity of material is known.



Typical Ford cup in side view and tilted position. It can be held in the hand or positioned level in a convenient frame or stand. A small flow-out hole is in the bottom.

The openings of all containers should be kept closed when not in

TESTING . . .

Here is a test that is used in extreme cases to determine the amount of moisture in the surface of the wood—so that the proper STILLE-YOUNG *tailor-made* finish may be prescribed—the *exact* specification needed for any particular job.

By careful analysis at the beginning of the run, we have saved thousands of *finishing* dollars for our customers.

S-Y

STILLE-YOUNG

CHICAGO

LACQUERS • FILLERS • STAINS • ENAMELS • PAINTS

use. This will prevent evaporation of valuable solvents and the changing of viscosity. Closed containers are also desirable in the interest of cleanliness and safety.

After all, there is only one viscosity for materials to be used on any particular job, and that is the right viscosity. It is up to the foreman finisher to know and maintain the correct viscosity of all material for each type of work. Then the work will be under dependable control— instead of being left to some Tom, Dick and Harry to use their hap-hazard methods.

Typical Viscosity Cup For Quick Testing

Editor's Note: Many readers have inquired about instruments for measuring the viscosity of finishing materials, and some have noticed mention of the Ford viscosity cup in various articles. Other makes of viscosity cups are available too.

According to information supplied by a manufacturer, the Ford cup illustrated here is made of cast bronze and can be supplied in natural buffed or polished chromium finish.

All that is required for checking the viscosity of a finishing material is a Ford cup, a stop watch and a sample of the liquid. The cup is mounted level in a ring stand. After placing a finger over (really under) the opening in the bottom, the cup is filled to overflowing. A stop watch is started when the finger is removed from under the cup to start the flow of liquid. Then the elapsed time is measured for material to run completely from the cup. This length of time (usually measured in seconds) is then compared to the length of time required for material of correct viscosity (as determined by previous experiments or trials) to flow from the cup.

Burdett Mfg. Co. Moves

Burdett Mfg. Co., manufacturer of infra-red radiant heat gas burners, announces that it has moved to 3433 W. Madison St., Chicago 24, Ill. The new telephone number is SAC-0700.

Enterprise Paint Mfg. Co. Moves Into New Modern Plant

The Enterprise Paint Mfg. Co., Chicago, Ill., has moved into new and larger quarters, and has combined its two plants Enterprise and Federal, under one roof. The new plant is located on South Ashland Ave. at 29th Street.

Manufacturing in this fine new efficient paint and varnish plant is on a "streamline" basis. Raw materials start at one end and come out at the other end complete, canned, labeled and ready to ship.

New laboratories for analyzing raw materials for standards of quality, for checking each manufacturing process, and for testing finished products, assure uniformity and perfection. A special laboratory is maintained for research and new product development.

The plant is located so that shipments may be made by truck, rail and boat.

DESIGN

An interview, highlighting the importance of the finish in product design, with a former president of American Designers' Institute,

C. E. WALTMAN, Industrial Designer

By Rosalie Flank

...CE THAT fellow I just ... greeted? He's interested in ... a new design for an over- ... crane," said C. E. Waltman, ...strial designer, as we walked ...n Michigan Boulevard toward ... unusual studio, recently com- ...leted on Chicago's near North ...side. Mr. Waltman, past president of the American Designers' Institute, is known as a pioneer in the design industry.

"A crane presents many interesting design problems because, aside from its mechanical operation there are several factors that must be taken into account", he mused as I hurried along trying to keep pace with the giant steps which were quickly bringing us to the headquarters of this design authority, where he and his staff turn out designs for many nationally known products. "Do cranes have to be designed?" I asked in surprise, "Isn't a crane just a piece of equipment, its design governed by mechanical construction? A crane is a work horse ... it has a job to do; is operated by ... mechanic; must it be beautiful ...

Stopping so abruptly I alm... lost my balance, he rep... "There is a great deal more t... sign than beauty. A desig... not just an artist. He is a sp... who must know how to ... item have the greatest u... along with sufficient b... eye appeal to create s... item that is in a com... today must be govern...

mental rules of design which will make that item give maximum utility along with maximum sales appeal, both to the buyer and the user."

Design and Color Applied to All Industrial Products

"Let's take a crane as an example. Sure it's a work horse, but it must be designed to eliminate accidents to the greatest degree. Maybe it can be simplified — streamlined—not only for appearance but for utility. It must be attractive enough so that the user will have pride in the machine and take care of it. People like to use and take care of clean attractive products. This has been proved in factories, offices and homes.

"Then there is the accident hazard to be considered. We'd have to go over it and make sure it was safe, by designing protective shields which would serve the double purpose of being a safety device and adding to the appearance of the unit.

"And would you have to consider the color?" I ventured as we started again toward the studio. "Of course; color is one of the most important elements of design; and color is basic. There must be a definite reason for using color; it is not a hit or miss affair."

Logical Reasons for Using Certain Colors

Mr. Waltman went on to explain that certain colors are established by precedent and there is no reason to change them since they become associated with the job they are meant to perform. Other colors are decided upon because of their association with their surroundings or because they will add to the prestige of the item.

"Look at that bus", he pointed up the avenue. "It's green and yellow. That's a good color for a boulevard bus. It can be seen from a distance, yet there is a certain amount of good taste; it blends well with the parks and buildings it serves. People instinctively feel the prestige of the bus and are willing to pay the 10-cent fare. If that bus were red and yellow it would cheapen it on the Boulevard. This is color psychology".

"What color would you make the crane?" I asked, intrigued by this color conversation.

"I'd probably make it red because red is associated with movement and with work. Red is also associated with danger — and an overhead crane, as it swings through a factory, must be observed from a distance. It would have a finish that would permit the operator to keep the machine looking nice and probably would have a nice trim to give added 'pride of possession' ".

Waltman's Designs Combine Efficiency, Utility and Beauty

At this point we approached the design studio, a unique modern building nestled in between the venerable old buildings which dominate Chicago's former Gold Coast. Although strictly modern this studio, due to its unusual landscaping and the choice of building materials used, blends into its surroundings surprisingly well.

We approached the entrance over a long ramp which by-passes a lily pond in the attractive grounds below and entered the studio which, though modern in every aspect, lacks the cold austerity usually associated with this type of building. Wood, cork and corrugated glass are effectively combin-

Baked and READY TO PACK in 8 MINUTES

with INFRABAKE WHITE No. 107

When first asked to bid on towel bar finishing, Oran Company, custom finishers, Columbus, Ohio, quickly realized the importance of minimizing handling. So they installed completely conveyorized equipment.

Then they adopted the following finishing system to go along with their conveyorized setup:

1. Bars vapor-degreased;
2. Conveyor-dipped coat of Berry Brothers' CBZ Red Primer, reduced 250%;
3. Air dry 7 minutes, then fog coat of Berry Brothers' Infrabake White No. 707, reduced 50%;
4. Air dry 12 minutes, then wet coat of Infrabake White No. 107, reduced 25%;
5. Infrared bake of 8 minutes. First 1/3 of oven, 250 watt lamps. Remaining 2/3 of oven, 375 watt lamps.

You've expected great things in postwar finishes, and Berry Brothers' Infrabake White No. 107 meets your every expectation—in color, hiding, speed of bake, toughness and after-bake color retention.

Send for liquid sample, or ask for representative to call.

BERRY BROTHERS
Paints · Varnishes · Enamels · Lacquers
Detroit 7, Mich. Walkerville, Ont.

BOSTON • JERSEY CITY • CINCINNATI • CHICAGO • ST. LOUIS
INGLEWOOD, CALIF. • MONTREAL • WINNIPEG • TORONTO

SEE OUR INSERT IN SWEET'S NEW PRODUCT DESIGN FILE

Quality Finishes Since 1858

ed in the structure. Growing plants and goldfinches basking in sunshine that streamed through the windows, added a comfortable charm. Designed by Mr. Waltman the studio demonstrates the skill of this man who has learned how to combine efficiency and utility with a basic beauty.

New Color and Finish for Johnson Sea Horse

As I glanced around the office, I was impressed with new colored sketches of an outboard motor which were hung on one of the walls. Surprised at seeing the motor in color I questioned Mr. Waltman about the sketches.

"That is the new Johnson Sea Horse. We've changed the color along with the design, because we feel that the bright aluminum color caused too much glare on the water. We had to use a finish that would stand up against the elements to which this motor is subjected—sun, wind and water. We have now perfected a tinted aluminum paint in a blue-green tone which will stand up against the elements and add new beauty to the product.

"We chose blue-green because it is the most natural color associated with water, and it will blend well with its surroundings. Because we believe that only discriminate people who demand the best buy the Johnson Sea Horse, we feel that color adds richness to the motor and that it gives the owner greater pride in possession. We added a red label because red attracts the eye. It calls attention to the fact that it is a Johnson Sea Horse, a name that carries prestige—a name that is well known. The red label adds the necessary relief to keep the motor from having a monotonous monotone.

"Many small boats are painted white. The blue-green motor, with its red label, is a fitting compliment. A number of other factors were also taken into consideration in designing the motor. We thought of the needs of the fisherman. He needs a light weight motor; one that's easy to put in the car; easy to carry and at the same time has power, maneuverability and dependability. All of these things must be combined with good looks and sales appeal."

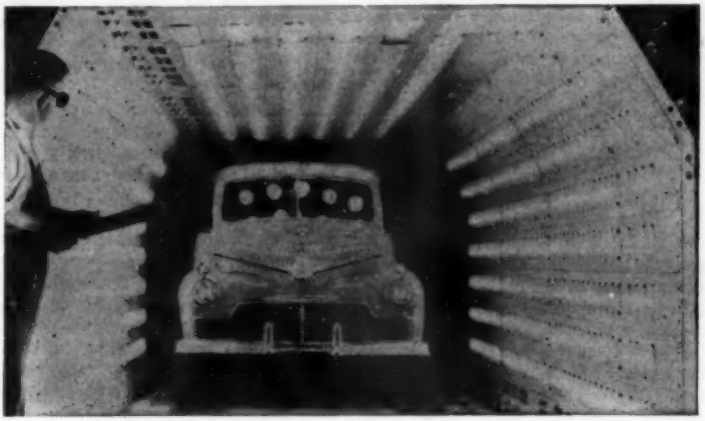
Salesmanship; Utility; Production Limitations are Factors, Too

"A designer must have a real knowledge of salesmanship. He must know how a product is to be used; must consider the requirements of the buyer and the user, and figure out how he can best fill these requirements. Above all, he must be practical. He must know how the item is to be manufactured and the limitations of machines which will produce it. He must keep abreast of new materials; must know production problems; keep up on new finishes, and have a practical working knowledge of design, and a 'sixth sense' for feeling the market", Mr. Waltman went on to explain.

"In some instances a change of color may affect the entire sale of a product. This was true of the Nesco roaster." As Mr. Waltman spoke he pulled out of his desk a picture of the new roaster — a gleaming beauty in white, black and chrome. "When we first started making the Nesco roaster it was tan and green, and oval in design. At that time the 'black and white' era for kitchens had not begun.

"Today we know it is a mistake to make a kitchen appliance any color but black and white with

Hot Tip on a Faster Finish!



Use G-E Infra-red Industrial Lamps for Drying, Baking, Heating, Dehydrating

Increase production, save time, save money — install radiant ovens equipped with G-E Infra-red Industrial Lamps to gain these six important advantages in your plant:

1. **LOW FIRST COST**—Equipment is simple and easy to install.

2. **FLEXIBILITY**—Infra-red ovens are compact, movable, readily adapted to a wide variety of production line operations. Utilize plant space to best advantage.

3. **INSTANT HEATING**—Infra-red energy creates heat on contact with work.

4. **FASTER PRODUCTION**—Reduces processing time to a minimum.

5. **LOWER MAINTENANCE COST**—Minimum inspection and repair.

6. **COMFORTABLE WORKING CONDITIONS**—No excessive heat around ovens.

CONSULT a radiant oven manufacturer to assure best results with G-E Infra-red Industrial Lamps. Or write us for further information. General Electric Lamp Department, Division 166 IF-10, Nela Park, Cleveland 12, Ohio.

G-E LAMPS

GENERAL ELECTRIC

chrome trim. When the first Nesco was designed it was oval. This was during the period when streamlining meant eliminating every corner and sacrificing utility to design. Then we found that a housewife could get more utility from an oblong roaster, as she could use the corners; that there was too much waste space with the oval roaster. Accordingly the oblong roaster was created, and sales jumped.

"Because it is used in the kitchen along with the larger appliances, it has to compete with these other appliances in beauty. When the roaster color was changed to black, white and chrome, this added new sales appeal. It looked richer; more for the money; it gleamed. Again the pride-of-ownership angle came into play. The user could polish it. The sparkling white color, highlighted with black and chrome, was fun to keep clean. It was rich and appealing. It took its place along with the larger appliances. Black and chrome — which can be polished and which add sparkle and richness—highten the appeal. Color is brought into the kitchen through accessories, cooking utensils, towels, etc."

White, chrome and black give this new Nesco roaster a rich appearance.

When, Why and How to Change Design of any Product

"How often do you think a design should be changed?" I asked Mr. Waltman. "Do you think an item should be redesigned or changed every year or two to give it new sales appeal?"

"As long as an item is outselling its competitors no change need be made in its basic design; only minor changes are made when and if desirable", was Mr. Waltman's reply. "Competition today governs changes. Every manufacturer tries to get ahead of his competitor. When a competitor's item begins to outsell him, due to offering greater utility, or eye appeal, then comparable features must be built into an improved design which will equal or surpass those already on the market.

"We all know that competition is responsible for most of the progress being made today. We have a modernly equipped pattern and model shop, a scientific testing panel and model kitchen in our studio where we give all of the products we design complete tests of every type. If it is an item to be used by a housewife, our home economist will test the new design until she feels it fulfills all of the requirements of the housewife. Then we add the necessary eye appeal in the way of finish and trim, for it is the finish and color that gives it sales appeal. Competitive items are also tested, for we feel it is important to know and appreciate our competition".

Psychology of Color Does Influence People

As we went further into the discussion of color and finish, Mr. Waltman emphasized the basic psychology of color. "There must be

The $64 Question!

INFRA-RED or CONVECTION OVENS FOR DRYING AND BAKING?

The most practical answer is now provided through the use of the ROSS

AIRAY

COMBINING

Infra-Red and Convection

This new ROSS development in oven design utilizes heat by infra-red radiation with proper air circulation —both under absolute control. This engineered combination provides many advantages not attainable with either an infra-red or convection oven alone. AIRAY effectively equalizes ambient oven temperatures, prevents stratification in the oven, eliminates the problem of fumes with positive exhaust, greatly shortens drying cycles at minimum cost for electrical energy. AIRAY is infra-red at its best!

* * * * *

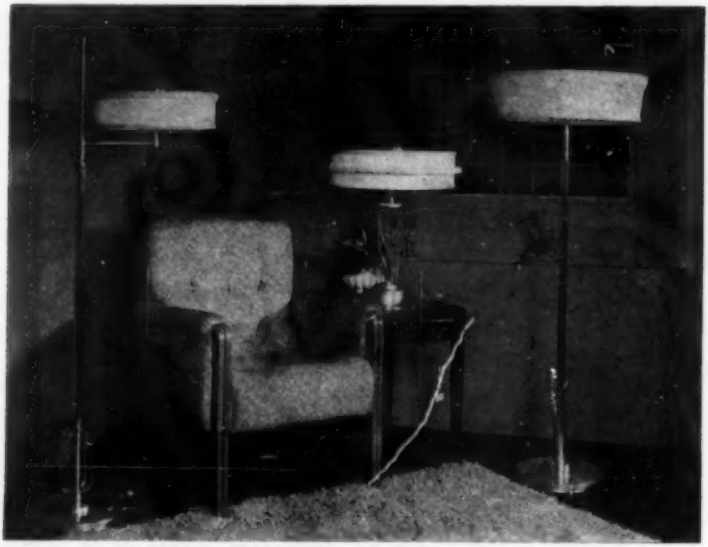
Drying and curing ovens designed for AIRAY are available for testing this modern method on your product at the completely equipped ROSS Laboratory. The facilities of this laboratory are at your service. Get in touch with our office nearest you.

ROSS SYSTEMS

J. O. ROSS ENGINEERING CORP.

DESIGNERS AND BUILDERS OF AIR PROCESSING SYSTEMS

ROSS CONTROL OF AIR FOR MODERN INDUSTRY SYSTEMS



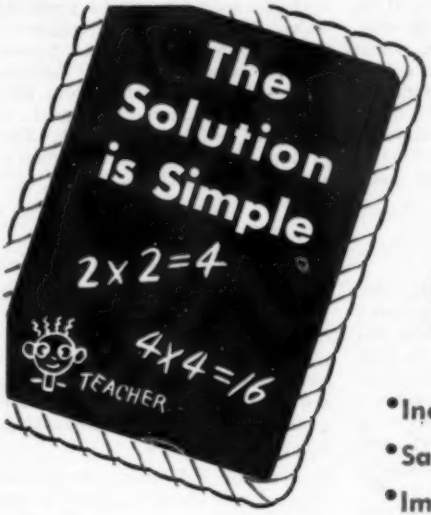
Floor lamps and table lamps for home or office, designed by C. E. Waltman.

a definite reason for using color. Primarily, color is used for sales appeal. Naturally, we want the item to look the 'most for the money'. Certain colors are basic. People have learned to expect certain items in certain colors; and to change these colors would do little to highten the sales appeal. In these instances we might add an attractive trim—perhaps stripe it to give the feel of motion; or add a colored label or change the finish, relieving the solid color by using some form of duotone, wrinkle finish, or a reproduction of wood, leather or marble grain, etc.

"If it is an item that is subject to abuse, where scratching and marring is a problem, we might use a finish that has a hammered or wrinkled effect which doesn't show scratches so much. Some items must be subdued to fit into their surroundings effectively; they need a dull finish. Others are given sales appeal by using a high luster finish.

"If we want to reduce the size or bulk of an item, we can add a contrasting trim, a duotone, or relieve the bulk of solid color by breaking up the mass with veiling, speckling or one of the various pattern finishes. On the other hand, if we want it to look larger than its actual size we may use a highly polished surface or a polished trim, extra banding, or lighten the color which sometimes increases its size.

"Color and finish are affected by the environment of the product. If it is to be used in a room with



with a PEDIGREE FINISH

- Increase Buy Appeal
- Save Production Time
- Improve Quality

Whether yours is a problem of reducing production costs, improving the appearance of your product, upping quality or increasing wear resistance, you will find a Pedigree Finish that will do the job better, faster and at less cost.

Pedigree's unexcelled research facilities and skilled technicians — more than 70 years of specialized experience — its staff of men trained in many industries — all are at your service to work out exactly the finish you require.

Tell us about your problems. We'll be glad to help.

the P. D. GEORGE CO.

5200 NORTH SECOND STREET
SAINT LOUIS 7, MISSOURI

wood finishes then it is natural to use tones that will blend in with the wood or a wood finish. Some manufacturers will suggest a color merely because they think it might be 'a good color' but upon analysis we may find that another color is more in keeping with the surroundings of the item or more appealing to the user."

Study of Modern Lamps; Color; Finish; Texture

Lamps, a field in which Mr. Waltman is well known, present an interesting study in colors, finishes and textures. Lamps fit into many types of rooms and must be adaptable to that room, yet a lamp is a utility — a unit in itself — a piece of lighting equipment, and must be regarded as such. Lighting and its function is therefore Mr. Waltman's first consideration. "Then a shade which offers a maximum asset to that function is considered and the shape of the shade is governed by the use of the lamp", he declares.

Since the designer, manufacturer or salesman cannot know in advance what colors are to be used in the room with a lamp, many of the lamps are "neutral" to insure their blending with any type of furniture or interior. Glass, plastic, wood and metal are effectively used, either singly or in combination for these lamps. Metals are satin finished to give a soft quality which will blend with fabrics in a room. Woods are usually light in finish to show the beauty of the wood texture. Glass and plastic are a neutral tone and give a modern touch. Familiar trims — symbols which women recognize and use in a room—add other decorative touches; the sense of traditional, combined with modern.

On through the list of products which Mr. Waltman designs — washing machines, clocks, pens, trays, accessories of every description — the theory of design, plus eye appeal, plus sales appeal is employed with a consistent effort to improve the product to keep it ahead of competition.

Alkyd Resin Finishes

EACH YEAR millions of pounds of glycerine go into the manufacure of protective and decorative finishes. Today, alkyd resins have reached the stage where they are the most important synthetic resins used by the surface coatings industry.

A major indication of the increased use of alkyd resins in finishes is that Government specifications for coatings have been widely based on these resins. The Army, Navy, Marine, Maritime Commission, and many Federal agencies have specified these finishes. Manufacturers of ordnance and radio equipment, trucks, jeeps, ships and aircraft, as well as quartermaster supplies, have all specified alkyd resin finishes.

Manufacturers have become accustomed to the fast production schedules which can be maintained by using variously modified alkyd resins. They feel that, if this type of finish meets the exacting requirements of various government agencies, it must be good and they want the best. This trend is also indicated by the fact that, not only automobile makers, but also the manufacturers of railroad and farm equipment are today looking for alkyd resin base finishes.— *Glycerine Facts.*

GET BETTER ACQUAINTED WITH

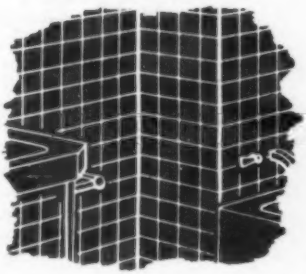
Vedoc

a better baked finish

for **PRESSED WOOD TILE BOARD**

CHARACTERISTICS:

Tough and durable . . . retains original luster indefinitely . . . complete color stability . . . easily kept clean and sanitary . . . practically immune to soap and cleaning compounds . . . high resistance to marring, chipping and scratching.



APPLICATION:

One coat primer followed by *one* coat of finish. (Additional coats of finish may be used when desired.)

BAKING TIME:

Primer: 15 minutes at 250° F. or air-dried overnight.
Finish: 30 minutes at 250° F.

All Vedoc finishes are developed for a specific use, then slightly varied to best fit each customer's production setup. Write today for more information about these "better finishes". Also ask for your copy of the new booklet, *A Review of Product Finishing with Organic Coatings.*

LIQUID PLASTICS DIVISION
FERRO ENAMEL CORPORATION
CLEVELAND 1, OHIO

Remove Danger of Drinking Solvents

ALTHOUGH most workers will not knowingly drink an organic solvent, protection from this possible hazard should be a plank in industrial safety platforms. For when solvents are taken internally, they may cause permanent damage to tissues and organs and, in severe cases, death may result.

Solvents may be swallowed by intent or by accident. The story is told of a worker who heard someone describe a certain solvent as being "toxic." The term sounded pleasantly similar to "intoxicating" whereupon the man decided he would sample the liquid, which he did with fatal results. If a worker is informed that swallowing chemicals is dangerous and that solvents are no exception to this rule, it is not likely that he will deliberately violate it.

Accidents, however, can arise from a number of circumstances. A case in point is that of a carpenter who was quietly drinking liquor in the dark. When he reached for the liquor bottle, after having set it down on a table, his fingers closed about a bottle of solvent placed on the same table. He drank some and died in about ten days. In another instance, a man came into a shop to see a pail of liquid, which he thought was water, standing open on a bench. He swallowed a dipperful before he realized it tasted peculiar. Fortunately, he immediately vomited and was none the worse for his experience.

All vessels or containers of solvent should be clearly marked and they should be kept out of reach of visitors and workers from other departments who may be passing through rooms in which solvent operations are performed. When not in use, containers of solvent should be properly stored.

A doctor should be called at once if anyone swallows a solvent, even if no symptoms of discomfort or poisoning are immediately evident. Solvents may have a delayed effect. First aid measures are limited to inducing vomiting, so as to remove the solvent from the body. Some common emetics are mustard water, lukewarm salty water, and soapy water. While waiting for the arrival of the doctor, the accident victim should lie quiet in a well ventilated atmosphere.—SAFETY RESEARCH INSTITUTE.

J. C. Mowry Retires from Pittsburgh Plate Glass

After 45 years association with the Pittsburgh Plate Glass Company's paint division, James G. Mowry, industrial paint salesman, has retired.

Industrial Paint Salesman with P. P. G. Co. for years, Mr. Mowry has now retired.

The most of Mr. Mowry's time with P. P. G. Co. was utilized in servicing the railway and petroleum industries, his headquarters being in New York City.

With the retirement of Mr. Mowry, the company announces that the sales of railway industrial finishes in the eastern territory now will be handled out of offices in New York, Baltimore and Pittsburgh.

Glenn N. Stanford will handle the sales from Baltimore; John Leonard, long an associate of Mr. Mowry in the New York office, will handle sales from New York; and Jack A. Burke will handle the Pittsburgh territory.

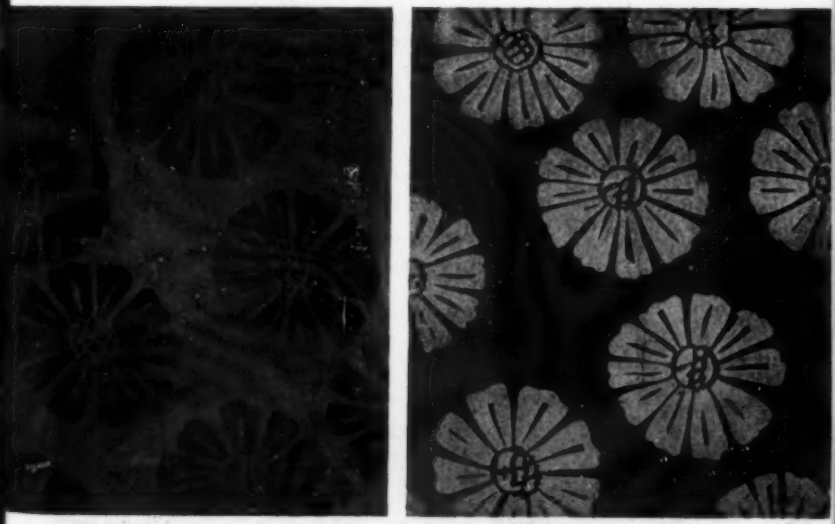
Calling attention to some of the more practical uses and new possibilities of coatings that contain fluorescent pigments which glow in complete darkness when activated by ultraviolet light.

LUMINESCENTLY speaking, a machine shop inspector sees otherwise invisible cracks in a smooth cylinder head as bright-colored streaks. The part being tested is dipped into an oil base containing luminescent material which clings inside tiny crevices. After the surface oil is washed away, exact patterns of almost invisible defects glow in the darkness when exposed to radiant ultraviolet or "black" light.

Glow-activating impregnants, splashed into industrial oil-dips for special detective work, come from

Luminescent COLOR COATINGS

BY J. P. CALLAHAN



Phosphorescent printed fabric in daylight—and same fabric in darkness.

Photographs loaned through courtesy of The New Jersey Zinc Co., New York.

a growing family of fluorescent and phosphorescent mediums that offer an impressive variety of useful possibilities. Luminescent outlines of directional signs kept Londoners safer during war blackouts. They will now help to keep workers in industrial plants safer during light and power failures.

Luminescent Coatings Served Useful Purposes During War

Luminescent instrument panels on flying fortresses enabled pilots peering into darkness to read their instruments without the glare effect from ordinary light sources. They will now enable pilots of modern passenger planes to avoid uncomfortable eye-adjustments of dark-adapted eyes, which are estimated to be from 50,000 to 100,000 times as sensitive to light as daylight-adapted eyes.

Luminescent uniforms and signal devices of cellulose acetate satin guided night bombing pilots to safe landings on new aircraft carriers. Luminescent coatings have been used for years on parts of stage and ice show costumes, to give novel and spectacular effects when the ordinary illumination is turned off.

More Luminous Pigments Now Available

New activating sources for such materials have no relationship to scarce self-activating radium salts and compounds. Inexpensive chemical impregnants or metallic sulfides used in pigments are given their luminescent power at the time of manufacture. Pigment production has already mounted to tonnage scales. Pigments are prepared by calcination at relatively high temperatures from exceptionally pure sulfides such as new zinc, cadmium, calcium and strontium or their mixtures. Tiny quantities of copper, manganese or silver "activators" give the luminescent touch.

Luminescence is not noticeable to the naked eye under direct sunlight, although in some cases treated material directs extra light to observers' eyes and is visible at greater distances than ordinary materials, including even vivid orange colored bunting.

Fluorescent Coatings Glow in Ultraviolet Light

The peculiarity of fluorescent pigments is that they depend for effect on exposure to an exciting source of ultraviolet light. In other words, they have little or no visible afterglow. The fluorescent equipment includes some arrangement for obtaining satisfactory "black" light that will stimulate color glow under actual use conditions.

Lamps used to excite fluorescence have nickel oxide glass filters or other satisfactory filters that shut out all or practically all visible light. Special fluorescent lamps, made with a special phosphor (called the 360 BL phosphor) which was developed for war use, emit appreciable amounts of ultraviolet. These lamps are available in a wide range of sizes, from 6-watt to 100-watt, and probably are the most economical sources of exciting radiant energy for fluorescent pigments.

Daylight Colors of Coatings Different in "Black" Light

Fluorescent colors vary according to daylight colors of pigments. A daylight cream fluoresces bright yellow, while a daylight greenish yellow turns to an exceptionally

Standard
ALPO
FINISH

Have YOU Discovered ALPO?

You have only to see this new polychrome coating to understand why manufacturers, big and little, are enthusiastically specifying ALPO for their latest products.

ALPO presents an appearance of rich depth with brilliant peaks and shaded valleys; yet the surface is perfectly smooth and dustproof.

Comes in most pastel colors. One coat application gives 50% greater coverage. No exacting special bake. High resistance to abrasion, heat, cold and humidity.

Go modern—specify ALPO.

SINCE 1870

STANDARD VARNISH WORKS
NEW YORK • CHICAGO
Engineers of Product Finishes

of fumbling by turns for a front door keyhole, a couple getting home from late movies will soon be able to locate the right spot by "cold" light.

Editor's Note: There is a distinct difference between *luminous or luminescent and fluorescent* paints and their practical value.

Articles painted with luminous paints must be exposed to light first in order to make them glow in the darkness afterward.

Articles painted with fluorescent colors need not be exposed previously to any light, but will glow in the dark only so long as an invisible ultra-violet light (black light) is turned on them. The moment this invisible light is shut off the colors cease to glow.

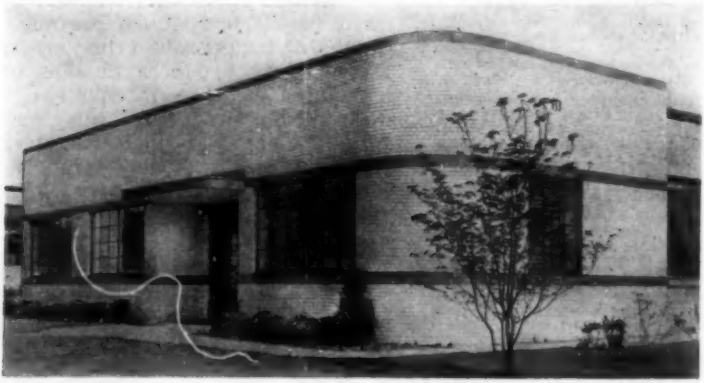
Industrial Ovens, Inc., New Name of I. O. E. Co.

Industrial Ovens, Inc. is the new name of the organization which was formerly known as the Industrial Oven Engineering Co., according to Mr. C. A. Litsler, president of the new corporation. At the same time the company formally announced establishment in its new plant and offices at 13825 Triskett Road, Cleveland 11, Ohio.

The organization specializes in engineering, designing and installing industrial heating and processing equipment, with particular accent on continuous operations in the handling of the materials to be treated. "This change in name and in corporate structure," said Mr. Litsler, "is merely an external indication of the progress this company has enjoyed from its inception. Management and organization have been markedly expanded to keep pace with the continually increasing response to the engineering service and equipment we have been supplying in the oven-treating and processing fields."

From an organization of five people in 1940, serving a limited number of companies in the metal finishing industry, the company has moved forward steadily. Its rapid growth and present stature are evidence of the soundness with which it has employed its basic principle—the engineered application of heat and continuous material handling operations as involved in industrial processing or oven treating.

Today in its new plant the company has some 42 employees in its Engineering Department alone. Its systems and equipment are widely used by a long list of the major producers in the rubber, wire, textile, paper and plastic-film industries, as well as many others. Industrial Oven installations are being used in Australia, South Africa, Canada, South America, England and several other European countries as well as throughout the U. S.



Front entrance to offices and plant of Industrial Ovens, Inc., Cleveland, Ohio.

CAPITAL TRANSIT RIDERS PICK "an Interchemical finish*"

Of the four public transit vehicles placed on exhibit at the recent Century of Progress show held by the Capital Transit Company in Washington, D. C., transit riders selected the car decorated with "An Interchemical Finish" as the one they would prefer to ride in.

The three street cars and a bus exhibited had been decorated by leading finishes manufacturers. With over 5,000 transit riders voting, the Capital Transit Company feels that an adequate cross-section of its riding public had been polled. As a result all new Capital Transit Company vehicles will be decorated and protected with "An Interchemical Finish."

"AN INTERCHEMICAL FINISH"

Is Engineered to Your Product

Capital Transit's finishing problem was to select a finish which combined beauty with durability. If you are designing a new product, having trouble with your present finishing operation, or are planning to change and modernize your production line set-up, Remember—To Give Your Product A Good Start—Give It "An Interchemical Finish."

If you're interested in product finishes, you'll be interested in our new booklet "A Film is Born." Send for your copy today. Write: Interchemical Corporation, Finishes Division, Dept. IF-10, 350 Fifth Avenue, New York 1, N. Y.

* Made by the Interchemical Corporation Finishes Division, a result of the recent consolidation of the business of Ault & Wiborg Division of Interchemical Corporation and that of the Murphy Varnish Co.

Interchemical Finishes

I am submitting for your editorial consideration a manuscript, "Dip Tank Fire Protection," complete with pictures and captions, which has been prepared exclusively for your use. I think you will find it an interesting and unusual example of fire prevention in the finishing field, with some basic principles expressed that are applicable throughout the entire industry.—THE AUTHOR.

Fire Protection of Dipping Tanks

BY P. W. EBERHARDT
Vice President of Walter Kidde & Co., Inc.

ONE OF THE greatest fire hazards in present day manufacturing processes is that of flammable liquids used for protectively coating various products. In many factories these coating materials are applied by a dipping procedure, which calls for the use of dip tanks. Dip tanks, from necessity, must have large open surfaces to receive the continuous flow of products and to maintain the proper amount of liquid. It is here in these tanks that fires can start with astonishing rapidity from stray sparks or flames, destroying valuable equipment and costing thousands of dollars in spoilage and lost production time.

Dip Coating Should Have Dependable Fire Protection

Flammable liquid fires must be quickly extinguished to prevent the flames from spreading and assure the safety of working personnel. A quick and dependable means of smothering or extinguishing the fire and protecting both workers and products is a prime requisite to forestall extensive damage or loss of life. Carbon dioxide has long been recognized as an excellent fire-smothering agent. In its action, carbon dioxide reduces the air's normal oxygen content from 21% to about 15% which is sufficient to "starve" the flames and kill the fire. Since it is an inert gas, carbon dioxide is harmless to humans, and the finest equipment is not affected by its action.

A typical modern installation of a carbon-dioxide fire-extinguishing equipment for dip tanks containing flammable liquids, is found in the Wabash Photolamp Corporation's plant in Brooklyn, N. Y. Two separate installations have been placed in the dip tanks used for inside and outside lacquering of the thousands of photo flash bulbs which daily pass through the machines. *(Continued on page 84)*

INDUSTRIAL FINISHES

Lacquers
Varnishes
Enamels
Stains
Fillers

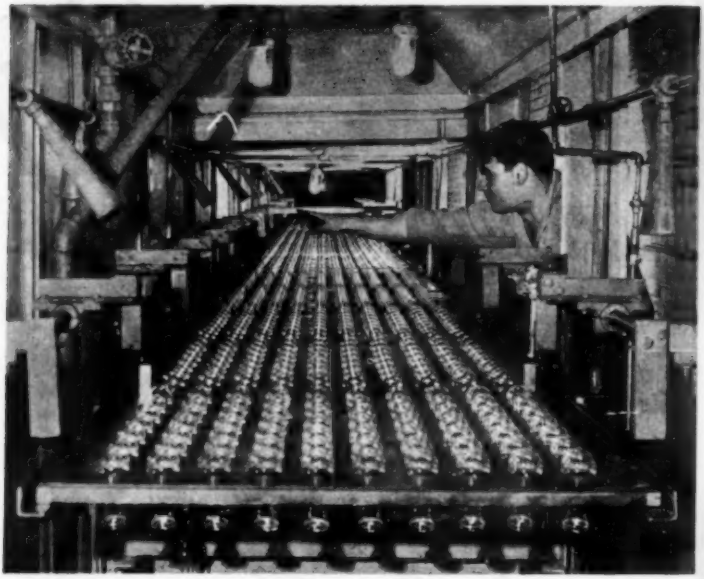
JONES-DABNEY

Since 1919
LOUISVILLE, KENTUCKY

RESINS AND GRINDING LIQUIDS

"Syntex" Alkyds
Grinding Liquids
Varnishes
Special Resins

JONES-DABNEY CO.
DIVISION OF DEVOE & RAYNOLDS CO., INC.
Factories at
LOUISVILLE - NEWARK - DETROIT



To protect photo flash bulbs undergoing the interior lacquering process at the Wabash Photolamp Corp., Brooklyn, N. Y., 12 carbon dioxide discharge nozzles are placed at strategic intervals in the 60-ft. chamber. Six of the nozzles shown here are directed at the bulbs, while six are directed beneath the bulbs at the collecting tank.

Protecting Setup for Coating Flash Bulbs

On one machine, for inside lacquering, the flash bulbs are placed in wooden trays before starting on the lacquering process. As a bulb-filled tray comes to the first station on the machine, the operator pulls a release and a synthetic lacquer is squirted into each bulb by compressed air. An automatic "arm" then pushes the tray to the next station where excess lacquer begins dripping into a waste pan. The tray continues along the machine as hot air jets dry the lacquer into a permanent film on each bulb's interior. When completely dry, the bulbs are removed for additional processing.

To provide fire protection at and near the station where the bulbs are undergoing this processing, 12 carbon dioxide discharge nozzles and two rate-of-rise actuators are placed strategically along the sides of the machine. Six nozzles are directed at the slow-moving bulbs, while the remaining six are directed at the dripping lacquer and collecting basin which returns the excess lacquer to a storage tank for reuse.

The nozzles extend only as far as the drying process, since the lacquer loses its extreme flammability

It's a winner!

Glidden's new
One-Coat Fine Hammerloid

GLIDDEN'S "OCF" HAMMERLOID is a *one-coat,* attractively patterned, hammered finish. It is admirably suited to innumerable metal articles, especially those of plain, simple design.

Using conventional spraying and baking equipment, one coat makes a beautiful, vari-hued film which is hard, tough and wear-resisting.

"OCF" HAMMERLOID is a low-cost medium for obtaining high-priced performance and appearance.

For further information, write today to . . .

THE GLIDDEN COMPANY
NATIONAL HEADQUARTERS • CLEVELAND 2, OHIO

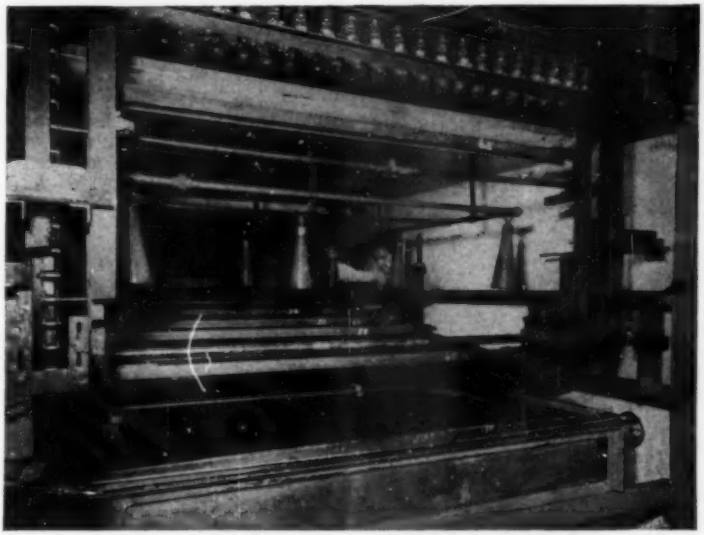
GLIDDEN'S "OCF" HAMMERLOID will meet many requirements for hammered finishes, but not all. Where products to be coated are of complex design, or when greater variation in pattern by simple spray gun adjustments is desired, GLIDDEN'S original HAMMERLOID will continue to be the favorite.

Pacemaker in Paints

upon drying. For added fire protection, the process is entirely enclosed in metal. All parts apt to cause sparking are made of brass or other non-sparking material. Trays holding the bulbs are made of wood. The flammable lacquer is stored away from the operation but, of course, the required quantities of lacquer must be fed to the machine as needed; this is accomplished by an automatically controlled feed line.

An extension of this system also protects the "safety spotting" operation. In this operation, the

A rate-of-temperature rise detector and carbon dioxide discharge nozzle protect the "safety spotting" operation from fire. In this operation, metal rods move up from an open tank of special lacquer to place a "safety spot" in the top of each bulb. After drying to a blue color, the spot becomes a safety indicator, turning red if the bulb is defective. The actuator is mounted on a baffle plate to "catch" the rising heat more readily than if located on an irregular and obstructed ceiling.



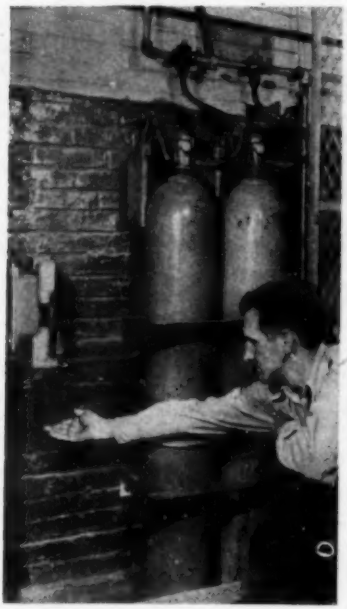
On the Wabash exterior lacquering machine for photo flash bulbs, eight carbon dioxide discharge nozzles and a rate-of-temperature rise detector protect the process from fire. Sixty thousand bulbs per day through this machine, receiving an exterior coat of lacquer which when combined with the interior coat, forms a strong, safety film to prevent the bulb from exploding when fired.

blue "safety spot" characteristic of Wabash flash bulbs is placed in the bulbs by rods moving up from a tank containing a liquid that has an alcohol base. Two carbon dioxide nozzles and a rate-of-rise actuator protect this process. One nozzle is directed at the tray of bulbs receiving the spot, while another bulb is directed beneath the operating platform at the liquid storage tank.

The second lacquering machine, used for placing an exterior film on bulbs, is located on the floor above the first machine and near the final packing station. The coating placed on bulbs by this machine, combined with the interior film, forms a strong safety bond to prevent bulbs from exploding when fired. Approximately 60,000 bulbs per day pass through this dipping tank which holds 150 gallons of cellulose acetate lacquer. This machine is also enclosed in metal; eight discharge nozzles provide carbon dioxide protection over the lacquer tank.

Fire Protection System Operates Automatically

Both systems operate in the same automatic manner. When fire breaks out, the sudden heat causes a pressure wave to travel from the actuator through piping to a diaphragm in the release mechanism. This release mechanism frees valves which open and actu-



When the pressure wave from the rate-of-temperature rise detector actuates the carbon dioxide release mechanism, heavy weights fall, opening the proper valves and allowing the carbon dioxide to rush through piping and out nozzles directed at the fire. In this rapid escape from the nozzles, the carbon dioxide changes from a liquid to a gas, expanding to 450 times its stored volume and quickly smothering the blaze by reducing its oxygen supply from a normal 21% to around 15%.

ate the cylinders, allowing carbon dioxide, stored as a liquid under pressure (850-lbs. per sq. in.) to rush through piping and out nozzles which are directed toward the flames.

As the carbon dioxide leaves the discharge nozzles, it expands to 450 times its stored volume. It turns into a snow white gas which quickly penetrates every nook and cranny of the machine and smothers the flames by its oxygen-displacing action. As a supplement to the automatic release, manual controls are located over each bank of cylinders. The entire action is completed in from 10 to 20 seconds, leaving the delicate machinery and flash bulbs unharmed except for initial damage sustained from the fire.

To Train Ex-Service Men in Technique of Finishing

On-the-job training programs under the G. I. Bill of Rights, for paint sprayers, leadmen and foremen, has been approved for members of the Finishers' Trade Institute, the association of enameling and japanning shops of Chicago, according to J. George Schneider, Executive Secretary. (Address of the Institute is 4000 West North Ave., Chicago 39, Ill.)

The program outlines in detail the various phases of training veterans with experience to learn the skilled operation of paint spraying, from handling of parts in shipping room, through degreasing operations, dipping, spraying, baking, inspection and shipping. Trainees will be expertly trained in such activities as masking of parts, care and maintenance of spray guns and equipment, application of special finishes such as wrinkle, hammer and spatter effects, and the mixing of paints and matching of colors. Training will be conducted by company officials, journeyman sprayers and representatives of paint and spray equipment manufacturers.

While in training, veterans will receive Government subsistence varying in amounts determined by the veteran's dependency status. Benefits are provided for under the Servicemen's Adjustment Act of 1944 (The G. I. Bill of Rights).

Details of the training program were worked out by the Finishers' Trade Institute through the hearty cooperation of J. Morgan Johnson, Local Representative of the Illinois State Vocational Training Department and Supervisor Robert M. James and Training Officer Bissell of the Local Veterans Administration Office, all of whom have years of experience and who were mindful of the serious shortage of well trained personnel in the Chicago enameling and japanning industry.

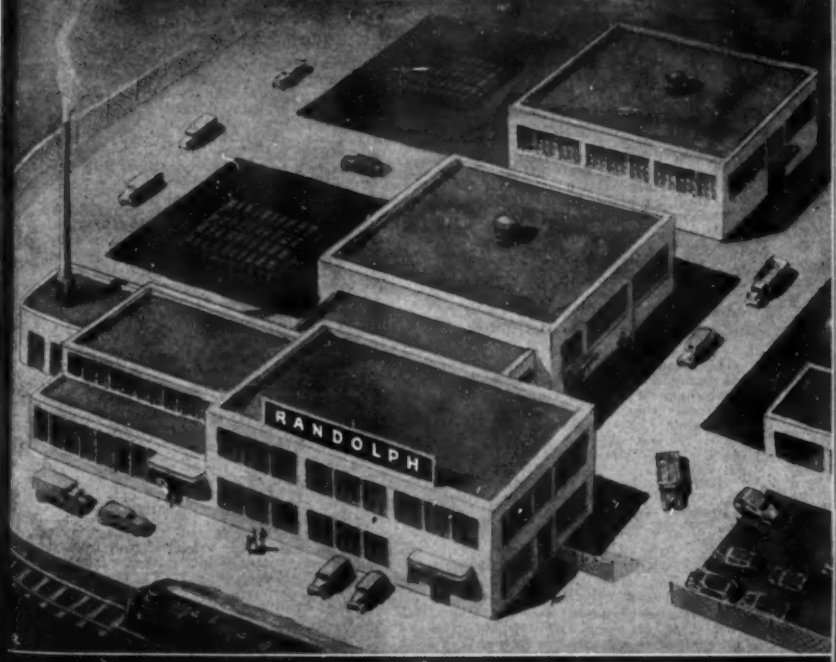
Many of the fifty enameling and japanning job shops of Chicago are instituting the training immediately and are soliciting the U. S. Employment Service for personnel.

ANOTHER RANDOLPH ACHIEVEMENT!

A Really Reliable

TEXTURE (WRINKLE) ENAMEL

Prompt Shipment



DOPES · LACQUERS · ENAMELS

RANDOLPH

FINISHING PRODUCTS CO.

Carlstadt New Jersey

Letters from Readers

Can Furnish Paint That Conducts Electricity

Referring to your September issue and the "Letters from Readers" on page 86, we note that "H. H." wishes to find a metallic paint to carry electric current. We would like to point out that we carry a patent for electrically conducted paints and have a paint called "Chromoplex," which is available for such purposes.

We would be grateful if you would pass this information on to "H. H." and we shall be pleased to supply him with technical information and samples.—Titanine, Inc.

We are forwarding copy of your letter to "H. H."—Ed.

Spray Booth Coating

Will you please send us the names of manufacturers of booth coating that can be sprayed on our spray booths to protect them from being stained by finishing materials that we use? This booth coating should be a product that can be easily wiped off the spray booth walls once each week.—N. C. Co.

Several concerns can supply what you want. We are sending you names and addresses in a letter.—Ed.

"Aridifier" for Supplying Clean Air

In the September issue of Industrial Finishing, on pages 110 and 112, you have published an article by Henry H. Logan entitled, "Spraying Calls for Clean Air." In this article a piece of equipment called an "Aridifier" is described as being capable of remedying much of the causes of faulty paint spray jobs.

We would appreciate it very much if you could furnish us with the name and address of the firm who manufactures this piece of equipment.—J. B. Co.

The "Aridifier" is a product of Logan Engineering Co., 4900 Lawrence Ave., Chicago, Ill. An illustrated write-up about it appears on page 100 of the September issue.—Ed.

Can Supply Crack Filler

We note on page 88 of September issue that "Y. Furn. Co.," is in the market for crack filler. We can supply this material in 350-lb. barrels, 100-lb. drums or 25-lb. drums. This material is very hard and durable. All that is required is to mix it with water and knife it into the cracks or indentations in the wood. It will quickly dry into a very hard surface. We can send a 1-lb. sample for a trial.—Cook Paint & Varnish Co.

Paint for Screen Wire

Some time ago a manufacturer sought our advice on means of protecting 14-mesh fly screen manufactured from low carbon steel, without raising the cost of the finished product above that of bronze screening. A thickness of .001-in. was suggested. He has tried a number of paints but without success, and was asking if any plastic material could be suggested.

I have seen a sketch of an installation where paint was air-sprayed on a screen as it passed over rollers and, in this case, the force of the air prevented plugging of the meshes. However, I do not know of any paint or plastic solution which could reasonably be expected to meet the service demands of fly screen. If you could give us any advice on a choice of suitable material, it would be greatly appreciated.—T. I. S. (Canada).

We believe that practically any advertiser in this magazine, who makes paints for metal, can supply a material satisfactory for screen wire. In a letter we are suggesting some of those nearest you.—Ed.

Paint Can Vibrator

We would appreciate it if you would send us the names of suppliers of 5-gallon change can paint mixers that you have on file.—C. Co.

Try Miracle Paint Rejuvenator Co., 127 E. 9th St., St. Paul, Minn.—Ed.

Tumbling Barrels

We are endeavoring to locate a source of supply for tumblers to be employed in the painting and finishing of small parts. The various buyers' catalogs list

GOVERNMENT OWNED **SURPLUS** PROPERTY

Industrial Finishes

ENAMELS • PAINTS
LACQUERS • PRIMERS

AN OPPORTUNITY TO REPLENISH YOUR STOCKS NOW

INDUSTRIAL FINISHES

METAL PRIMERS
Zinc Chromate Primer Spec. AN-TT-P-656 — $1.30 per Gallon
Zinc Chromate Primer for Ferrous Metals Spec. 3-171 — .45 per Gallon
Synthetic Resinous Primer Spec. 3-183 — .45 per Gallon
Lacquer Resinous Synthetic Primer Spec. 3-172A — .45 per Gallon
Products Refinishing Primer Spec. 3-173

PIGMENTED LACQUER
Luminous Lacquer Spec. 3-163 — $ .50 per Gallon
(This price applies to all colors except Olive Drab)

SPECIAL
All Olive Drab Paints—Lacquers—Enamels
(minimum sale quantity 500 gallons) — $ .30 per Gallon

RED LEAD PAINT
Ready Mixed Red Lead in Oil Paint Spec. TT-P-86 — $2.60 per Gallon
150,000 one-gallon cans in the inventory of the Spokane, Wash. Regional Office

ACID PROOF BLACK PAINT
Spec. 3-106-2 — $ .56 per Gallon
(metal for many purposes)
Chlorinated Paint Spec. T-1279 — (A Utility Black Moisture Paint) .35 per Gallon
Olive Drab, Lacquer — .69 per Gallon
All other colors

PRICES ARE F. O. B. LOCATION

Although this material has been previously offered to priority claimants, 10 per cent of the merchandise has been reserved to fulfill any further needs of priority claimants including VETERANS OF WORLD WAR II who are invited to contact the Regional Offices serving their area.

EXPORTERS: Most surplus property is available to the export market. Merchandise in short supply is withheld from export and if such items appear in this advertisement, they will be so identified by an asterisk.

HERE'S your chance to obtain large quantities of protective coatings . . . NOW DECLARED SURPLUS . . . manufactured to meet rigid Government specifications. Certain types and kinds now in surplus may be in short supply commercially (due to lack of raw material). However, you will find many of these in our inventory and available immediately. Your nearest War Assets Regional Office can quickly give you complete information regarding the bargain prices, locations, quantities, types and colors available. Special inter-regional service will provide you with similar information from other Regions.

NOTE: In addition to paints and accessories for general use, available stocks include many *special purpose* finishes.

WAR ASSETS ADMINISTRATION

GOVERNMENT OWNED SURPLUS

Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Fort Worth • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Oklahoma City • Omaha • Philadelphia • Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane

tumblers for metal finishing and plating, but none of the type in which we are interested.

We shall appreciate your advising us of the names of manufacturers of this type of equipment and, if possible, an estimate of the various sizes in which they are made.—Higgins, Inc.

Try H. M. Kenyon & Co., 9 S. Clinton St., Chicago 6, Ill.—Ed.

Protective Peel-Off Coatings

In your April 1946 issue of Industrial Finishing, page 24, an advertisement of The DeVilbiss Co. mentions a cobwebbing material used by the U. S. Army Ordnance Dept. I am eager to learn the names of manufacturers of this cobwebbing material and would appreciate your help.—S. J.

Several concerns can supply this material. Names and addresses are being sent you by letter.—Ed.

High-Gloss Aluminum

We are eager to find a source that supplies aluminum powder which will produce a high gloss when used as a pigment for a lacquer base vehicle. We wish to produce an exceptionally bright finish, which cannot be achieved by the ordinary aluminum powder presently in use. Your recommendations in this direction would be highly appreciated.—(Aircraft Co.).

We are not sure about this. Does some reader have any suggestions?—Ed.

Sparkproof Floor Inquiries

We have received several inquiries regarding the write-up on our product, "Masterplate" for floors, as published in the August issue of Industrial Finishing (page 118). If it can be conveniently arranged, we would appreciate receiving three copies of this issue.—The Master Builders Co.

To Finish Bobby Pins

We are interested in obtaining information on equipment for finishing bobby pins. Can you be of any assistance to us?—A. Co.

Try Ronci Machine Co., 2 Atlantic Blvd., Centredale 11, R. I.—Ed.

Bleaching Material

We seek information on materials and methods for bleaching the heartwood of sweet and sour gum, and wonder if you can direct us to concerns making or using such bleaching material?—K.I.

Several advertisers in this magazine can supply bleaching materials. In a letter we are listing names and addresses. —Ed.

Kill Rust and Solder Acid

What kind of solution do you have that will kill rust and acid in solder? We are having trouble with the finishing of metal caskets.—X. Casket Co.

Manufacturers of metal cleaning compounds can supply a suitable material—see advertisements in any copy of this magazine.—Ed.

Electrostatic Spraying

We are interested in securing information relative to Electrostatic Mist Spraying, and would appreciate your sending to us any information you may have on this process. At present we are faced with the problem of efficiently spraying an 8-in. diameter, 4-bladed fan (common desk type fan blade). Any assistance you may be able to give us in this matter will be greatly appreciated.—E. Laboratories.

Write the manufacturer of this process, Harper J. Ransburg Co., 1232 Barth Ave., Indianapolis 7, Ind.—Ed.

Waterproofing Preparation for Concrete

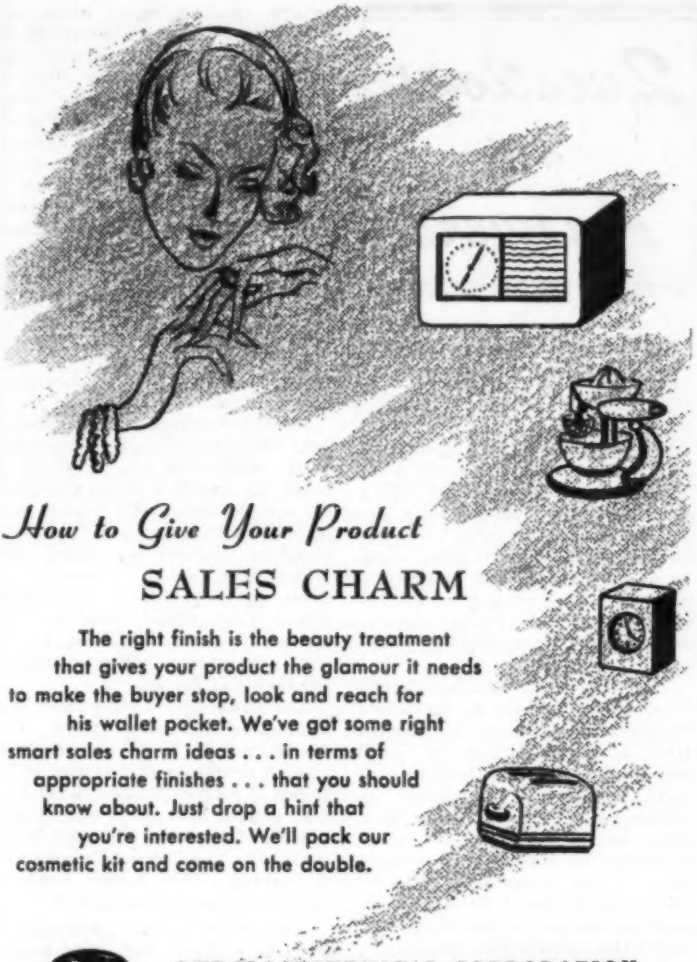
Could you give us some information on the waterproofing material for concrete, called Acquilla?

We are building a factory of cinder blocks and are interested in getting a material for the interior walls that will waterproof and at the same time whiten same. Could you give us sources of material for this? We would like something rather inexpensive.—C. & H.

Perhaps you have in mind "Aquella", a waterproofing paint made by Modern Waterproofing Paint Co., New York, N.Y., according to our directory. In a letter we are giving you the names and addresses of several other companies that make or supply waterproofing materials.—Ed.

"Lacquer Control" Inquiries

We want to thank you for the article in your June issue in regard to our product, "Lacquer Control" (page 114). We have received several inquiries on this material from your article.—Brown Paint Co.



How to Give Your Product

SALES CHARM

The right finish is the beauty treatment that gives your product the glamour it needs to make the buyer stop, look and reach for his wallet pocket. We've got some right smart sales charm ideas . . . in terms of appropriate finishes . . . that you should know about. Just drop a hint that you're interested. We'll pack our cosmetic kit and come on the double.

SEA-LAC

DURALAC CHEMICAL CORPORATION
LISTER AVENUE, NEWARK 5, N. J.

Questions and Answers

Rotating Device Does Indicate Viscosity

As a result of publishing, in August issue, an inquiry about "an instrument for measuring paint viscosity by inserting a rotating motor driven paddle into a paint container, the viscosity being indicated on a dial", we received several replies from readers and one each from two manufacturers of rotating-type viscosimeters. Unfortunately no illustration of either instrument is available at the moment.

The Brookfield Synchro-Lectric Viscosimeter is made by Brookfield Engineering Laboratories, Sharon, Mass. It can be held in one hand and dipped into the open top of any container — or it can be clamped to the upright rod of a stand on which is placed a small container of material. The upper part of the instrument includes an enclosed electric motor, a recording dial and a handle through which the electric cord passes.

Quoting from the company's literature:

The principle upon which this instrument operates is the measurement of the drag produced upon a cylinder or disc rotating at a definite constant speed while immersed in the material under test. A synchronous motor assures unvarying speed, and the torque measuring unit (a beryllium copper spiral spring) and affiliated parts are amply protected against strain, thus insuring permanent accuracy.

Only a few seconds are required for each reading, and several may be taken during a fraction of a degree change in temperature, thus generally eliminating the need of constant temperature control. Speed is also of great value in testing materials whose viscosity changes rapidly due to evaporation, polymerization, etc.

Results obtained with the Brookfield viscosimeter are in absolute units, centipoises i.e. 1/100 of a poise, the standard of use and comparison throughout the world. Two scales, 0-100 and 0-500, are provided on the dial to simplify the multiplying factors necessary to cover the ranges provided by each model. Each model covers a wide range of viscosities through the use of related interchangeable spindles and factors.

The Brabender viscosimeter is a product of Brabender Corp., Rochelle Park, N. Y. On this machine a small container of material to be tested is rotated while a little pivoted paddle, lowered into it, is held almost stationary. The paddle is mounted on a vertical shaft and is lowered to the proper depth in the liquid being measured.

The liquid in the rotating can imparts a force that tries to rotate the paddle. This force or strain is measured by the angular displacement of a spring. A lever arm connected with this spring is provided with an inking mechanism, which draws a continuous

Design For Service To The Machine Tool Industry

(Beginning in 1929)

It is no accident that Lowe Brothers finishes have long been used by the majority of machine tool manufacturers. Here's the story:

Back in 1929, Lowe Brothers Finishing Experts went to The National Machine Tool Exhibition in Cleveland, to restore the finish on tools which were chipped or scarred in shipment. They have been doing it ever since!

In 1929, also, Lowe Brothers developed the color that was adopted by the Machine Tool Builders Association. It is still the standard of the industry.

It was Lowe Brothers who helped break the bottleneck in production caused by the slow-drying varnish type of finishes. Lowe Brothers developed a lacquer finish, which reduced application time by two-thirds by the spray method, cut drying time of each coat from overnight to 15 minutes, and provided a finish which holds up under cutting liquids.

Lowe Brothers finishes are the recognized standard of the machine tool industry. You can rely on Lowe Brothers experience for machine tool and industrial finishes of every type.

★ ★ ★

INDUSTRIAL SALES
THE LOWE BROTHERS CO.
DAYTON, OHIO

Lowe Brothers
FINISHES for Industry

line upon a chart moving under the pen at a constant speed.

One end of the spring which opposes the torque is connected to the pivoted paddle shaft by means of a small arm, while the other end is fastened to the frame. Set screws are used for fastening this spring, so that it is easily replaceable if springs of different sensitivity are needed to extend the range of measurement. The paddle shaft is provided with stops which prevent damage to the spring through imposition of excessive torque. The paddle itself is also removable, in order that different types may be inserted for special purposes.

The instrument is built upon a rectangular base, to which is bolted a casting that supports the recording mechanism and the pivoted paddle and spring. Inside the base casting, a constant speed a-c. motor is housed, whose shaft is extended down to permit the attachment of a set of pulleys.

The recording mechanism is likewise driven by a constant speed motor.

Petroleum Spirits for Cleaning Metal

We are in search of some information about the possibilities of petroleum spirits for cleaning the surfaces of metal parts and products in preparation for painting or finishing. We have found such a diversity of metal-cleaning problems, and such a diversity of equipment and methods that we are turning to you. We are interested in petroleum spirits which are recommended chiefly for removing cutting oils, lubricating oils and greases.

Questions in our mind are:

1) What are the other substances that get on metal products during manufacture, which can be removed by petroleum spirits?

2) What are the other chief ways of removing them?

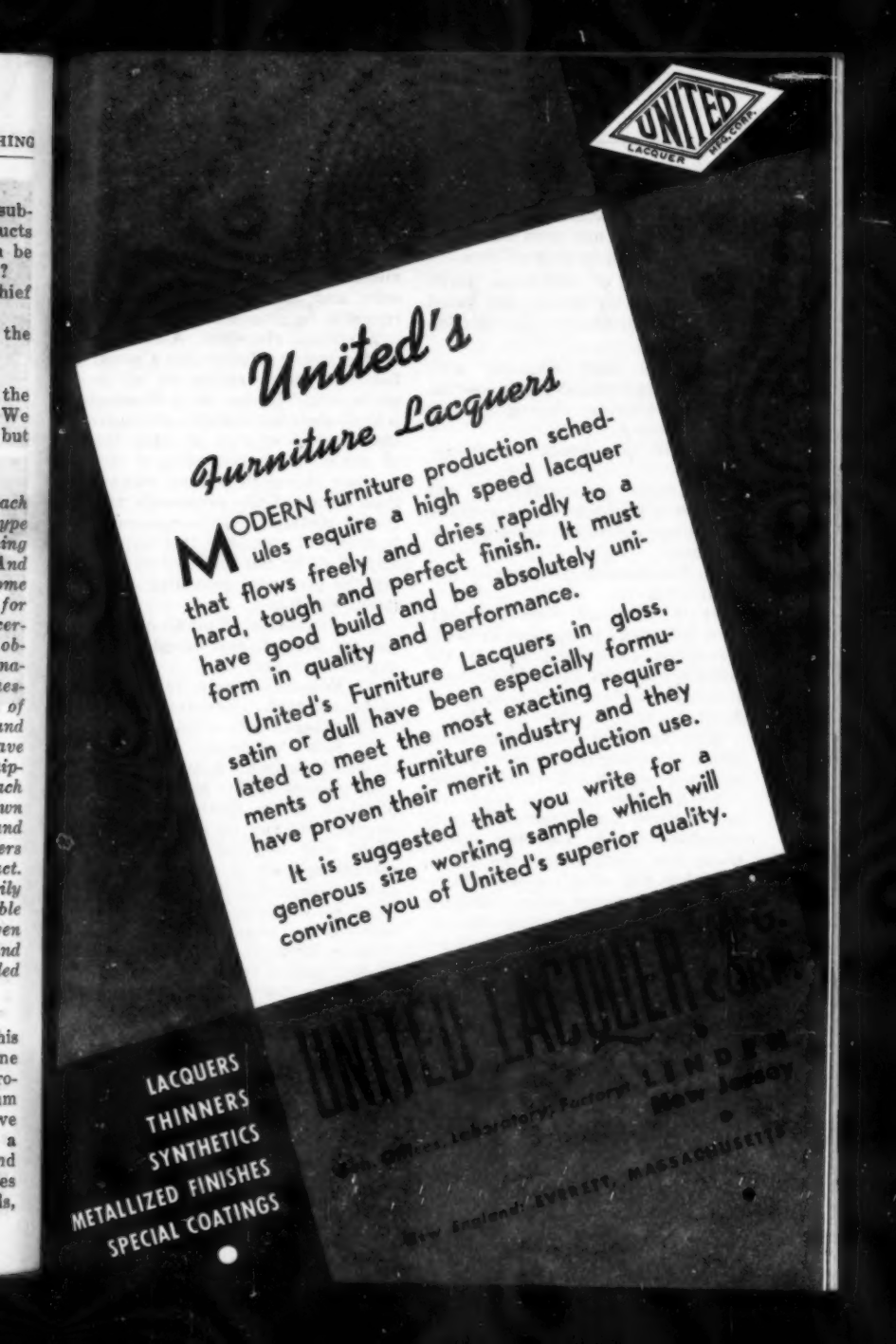
3) What are the merits of the other methods?

4) Their disadvantages?

5) What, in your mind, are the merits of petroleum spirits? We have some ideas of our own, but would like your opinion.—I. N.

Editor's Note: Naturally each method of cleaning and each type of cleaning equipment and cleaning material has its adherents. And unquestionably, each one has some advantages and disadvantages for certain types of work, under certain conditions. In an effort to obtain a few unbiased and informative replies to the foregoing question, the Editor referred copies of the inquiry to several practical and experienced men who are or have been users of metal cleaning equipment and materials. Of course, each man bases his reply upon his own knowledge and experience — and perhaps the experiences of others with whom he has come in contact. Also, the replies are necessarily brief because space isn't available here for a complete outlay of even a major portion of the data and opinions that could be assembled on the subject.

A book might be written on this subject. I will attempt to outline some of the highlights of petroleum spirits cleaning. Petroleum spirits, being a hydrocarbon, have pronounced characteristics as a non-polar type of solvent, and therefore have solvent properties for all non-polar type organic oils,


UNITED
LACQUER
United's
Furniture Lacquers
MODERN furniture production schedules require a high speed lacquer that flows freely and dries rapidly to a hard, tough and perfect finish. It must have good build and be absolutely uniform in quality and performance.
United's Furniture Lacquers in gloss, satin or dull have been especially formulated to meet the most exacting requirements of the furniture industry and they have proven their merit in production use.
It is suggested that you write for a generous size working sample which will convince you of United's superior quality.
LACQUERS
THINNERS
SYNTHETICS
METALLIZED FINISHES
SPECIAL COATINGS
UNITED LACQUER CO.
LINDEN
New Jersey
EVERETT, MASSACHUSETTS

greases, cutting compounds, etc., used on metals. Because of this non-polar characteristic petroleum spirits will not mix with water except, of course, in an emulsion.

Advantages of petroleum spirits cleaning—in my opinion and based on my experience— are as follows:

1) Quick easy cleaning with minimum equipment requirements.

2) No heating, rinsing or drying necessary.

3) Will not attack metal surfaces.

4) Leaves the surface of the metal in a rust-inhibited condition, retarding corrosion between operations.

5) Economical in material and labor cost.

6) When small residue of solvent is trapped in crevices or pockets (such as welded seams) the residue does not have serious detrimental effect on subsequent paint films.

Disadvantages of petroleum spirits cleaning—also my opinion and based on my experience— are:

1) Because the oils being removed from metal are completely dissolved in the cleaning agent, these oils contaminate the batch, reducing the effectiveness of the cleaning operation when following pieces are immersed in the cleaner.

2) Inorganic salts, carbon smuts and other residues are not removed.

3) Fire and health hazards.

Other cleaning methods are:

1) Chlorinated hydrocarbon. When an atom of chlorine is combined with a hydrocarbon molecule, its solvent properties are increased; its vapor pressure and rate of evaporation are also increased. It becomes a slightly more polar type of solvent. The chlorinated hydrocarbons used for cleaning are non-inflammable, but they have greater health hazards. Furthermore, complicated equipment with some heating arrangement must be used. Inorganic salts and carbon smuts are not removed by this process.

2) Alkali cleaning. Alkali in a heated water solution has a powerful destructive action on all organic oils. It can do a thorough job of cleaning except, of course, the removal of rust or other type of scale. Properly used, it does a more thorough job of cleaning than either of the previously mentioned methods. It is economical in material cost, but this is partially offset by the fuel cost of heating the tank and providing subsequent drying.

Disadvantages of alkali cleaning (in my opinion and based on my experience) are:

1) Requires costly installation of heated tank, rinse and drying.

2) Attacks soft metals.

3) Salt residues, improperly rinsed cause paint failures.

Petroleum spirits have ideal application as a cleaner where a single stage can be used, where a slight oily residue is not detrimental, and where a fire hazard is not a distinct factor (such as proximity of welding, etc.). It is exceptionally advantageous as a cleaner between machining operations, before inspection, or as a precleaner for a 2-stage cleaning system. It can be used for almost any cleaning operation where the quantity of work to be done does not justify an expensive setup—expensive to install and expensive to operate.—J. J. SMITH. (Supt. of Finishing).

During my experience in many plants that I have serviced, cov-

ering painting operations, I have found that with very few exceptions petroleum spirits can be used in place of high-flash-point thinners for removing dirt, oils and grease.

For example in every machine tool plant I found that dirt, oil and grease were being removed by using the thinner that was used for reducing the enamel or lacquer. The thinner cost anywhere from 85 cents to $1.50 per gallon. This high priced solvent was also being used for cleaning spray guns, hose and pressure tanks, and in many other places where petroleum spirits or comparable materials could be used with satisfaction and at substantial savings during the period of a year.

It was the general opinion of paint foremen that if petroleum spirits were used for removing foreign substances, they would soften the undercoats. This conclusion is false and has been proved so in every manufacturing plant I have serviced.

Today many of the manufacturers of machine tools are priming and sealing before machining; and during machining operations oil and grease and dirt are bound to get on the surfaces and must be removed before the final paint coat is applied.

The method I have recommended is to spray solvent over the entire machine and then wipe with a clean cloth, using an air gun to remove the lint. The spray method is far better than the method of saturating a cloth and wiping off the grease and oil, as this procedure has a tendency to spread the oil and grease rather than remove it. It is also more economical from a standpoint of labor and material waste.

There are many other methods being used today, but I have found from experience that petroleum solvents for this type of degreasing are economical and satisfactory.

Again, petroleum spirits can be used where thin coats of oil or grease are to be removed before priming or painting operations. It is my candid opinion, however, that petroleum spirits cannot compete with materials such as trichlorethylene used in the leading makes of degreasers, as the cleaning operations are quite different. I might mention here that when or if it is not necessary to use trichlorethylene, and when a petroleum solvent will be strong enough to remove foreign substances, I woud recommend it. To remove heavy slush coats of grease, other methods must be used, such as trichlorethylene or, for instance, the hydro-steam cleaner which produces an atomized spray.

The processes of cleaning metal parts may be roughly grouped under four classifications.

1) Cleaning for assembly or between manufacturing processes.
2) Cleaning before painting.
3) Cleaning before plating.
4) Rinsing and drying after plating.

In conclusion, it is my opinion that there are instances where petroleum spirits can replace higher priced materials that are being incorrectly used, with substantial savings being affected for the manufacturer, especially on any type of metal where nothing more than dirt (not rust), oils or grease must be removed before painting to provide proper adherence of the paint materials.—C. Raymond Syer, Industrial Engineer. *(Continued on page 106)*

This subject is one that has been wrangled pro and con in every large plant. Very little petroleum spirits are used in the larger plants that have setups for vapor degreasing or alkali cleaning, because of fire hazard which is always greater with all petroleum distillates having low-flash points. However, throughout the war, people making high precision bearings, etc., were using liquids of this type to pressure wash off storage lubricants and fine metal chips before such parts were placed in service.

Another case I saw was where painted aluminum parts were degreased in it because it did not attack the paint as did the vapor type degreasants. I have also seen petroleum spirits used on parts to be plated because the vapor degreasants left a chalky residue unfavorable to smooth plating.

My answer to the questions, as numbered in the inquiry, are:

1) Chiefly metal chips and shop dirt adhering to the rust preventatives or cutting oil already on them.

2) The most widely used methods in large production shops are vapor degreasing with trichlorethylene, alkali cleaning in hot aqueous solutions, and pressure spraying with petroleum spirits or kerosene, or immersion in these liquids.

3) They lend themselves to big shop conveyor methods with no fire hazard, being non-inflammable.

4) High maintenance and solution costs. Alkali is dangerous from the standpoint of skin burns, and trichlorethylene is badly toxic from the fume standpoint and necessitates periodic examination of workers in contact with it. Lawsuits have been filed by workers claiming injuries to lungs, heart, etc.

5) Petroleum spirits could be used more widely if better equipment that would lend itself to production were available for their use. Their low cost and high recoverability by distillation makes them attractive if the problems of using them were properly approached . . . —CARL W. MCNEIL, Engineer.

Random Comment on the Industrial Scene

(Continued from page 9)

port Control, insists that the area is a negligible market.

"I see no great trade with that part of the world for American exporters," he declared recently. "The only exceptions to this prediction are a few specialized lines such as motor equipment, perhaps radios, and a few things of that kind, which we have no competition at the present time."

General Maxwell points out that our prices are too high, there are countless exchange obstacles, and there is little for us to import from that part of the world. But even if we had all of the trade of that area, he concludes, it wouldn't amount to much.

* * *

New Lamp — A tiny sterilamp, no larger than an ordinary automobile headlight bulb, is now available for use in household refrigerators, to kill airborne bacteria and to cut down on the transmission of food odors.

Developed by Westinghouse, it will cost about five cents a month to operate. For some years, of

course, larger replicas of these midget lamps have been used in big food refrigerators, as well as in schools and hospitals, in order to check the growth of mold and bacteria.

* * *

Building Collapse? — Some unpleasant comments have been offered by Dr. Ernest M. Fisher, professor of economics at Columbia University. He fears that existing price levels and the possibility of further increases may breed conditions leading to collapse of the current boom and the whole real estate price structure.

Dr. Fisher is deeply disturbed by the threat of a staggering mortgage debt within two years. "Whether this volume of indebtedness, built up in a period of rising prices, high costs of construction and shortages of both material and labor," he adds, "can be sustained when the liquid assets of the public have been depleted is a grave question of major importance."

* * *

Furniture Demand—How big is the backlog of orders in the furniture hardwood field? In the eyes of Burdett Green, manager of the American Walnut manufacturers Association, it is "not as great as it looks."

He points to the familiar matter of pyramiding, making the accumulation look a lot more impressive than it really is. Green remarks that manufacturers have enough lumber now to prove that when the initial demand is satisfied, the backlog begins to fall sharply.

Production of walnut veneers has been running at a rate 50% above the 1940 level, but the output of walnut lumber has been hovering only around half the pre-war figure. In the case of white oak, there is little available for furniture, because that wood has been diverted into production of whiskey-barrel staves.

* * *

For Visitors—Readers of *Industria Finishing* may obtain free tickets on request to numerous outstanding radio broadcasts. When planing a trip to Manhattan, drop a line to: *Lawrence H. Singer, 130 West 86 Street, New York 24, N. Y.* Among the cooperating sponsors are:

Gulf Oil Corp. ("We The People"); B. F. Goodrich Co. ("Detect and Collect"); and Pharmaco Inc. ("Double or Nothing").

American-Marietta Buys Two Pacific Coast Firms

Purchase of the Pacific Chemical Co. of Los Angeles, Calif., and Adhesive Products Co. of Seattle Wash., by the American-Marietta Co., occurred recently.

Pacific Chemical Co., which started in 1920, is a manufacturer of insecticides, DDT products, and cleaners for the industrial and automotive trade. Its products are marketed under the trade name of "Pronto."

Paul R. Pariseau, who joined Pacific Chemical as Chief Chemist and Production Manager in 1937, becomes General Manager of Pacific Chemical, which will be operated as a wholly owned subsidiary of American-Marietta.

Adhesive Products Co., organized 1932, is a manufacturer of adhesives and synthetic resins used in the manufacture of plywood and for other industrial purposes.

An expansion program for both the companies is being planned and will be inaugurated at an early date.

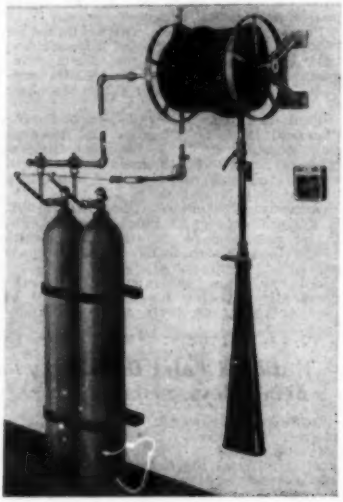
National Paint Dictionary Being Revised by Author

Jeffery R. Stewart of Stewart Research Laboratory, P. O. Box 173, Washington, D. C., is preparing manuscript for the forthcoming revision of his excellent reference book, "The National Paint Directory." He will welcome suggestions and accurate information from individuals and concerns in the industry.

Materials Supplies Equipment

Carbon Dioxide Hose Reels

For protection against semi-fixed fire hazards too large for portable extinguishers or unsuitable for a built-in system, carbon dioxide hose reel installations provide an excellent safeguard. There is a special nozzle, handle, and shut-off valve — and an ample supply of hose for fighting flammable liquid and electric fires.



A carbon dioxide hose reel setup ready for use in case of fire.

These hose reels are designed to guard hazardous processes, or any space where wheeled units cannot be used, particularly in locations where aisles are restricted.

One or more cylinders of carbon dioxide stored as a liquid under 850-lbs. pressure per square inch may be employed. Multi-cylinder applications may use each cylinder singly, or release all cylinders simultaneously. Local or remote release mechanisms (cylinders located at a distance from reel) are provided.

Equipped with carbon dioxide— a non-conductcing gas — hose-reel equipment is also highly effective in fighting fires in electrical hazards such as motors, generators, transformers, oil switches, telephone switchboards, radio transmitting and receiving equipment and other electrical apparatus. The newly-designed reel can accommodate up to 100-ft. of ½-in. hose.

Hose reel equipment for use with carbon dioxide gas is manufactured by Walter Kidde & Co., Inc., Belleville, N. J.

Krink-A-Lac, New Air-Dry Wrinkle

The Western States Lacquer Corp., 5000 E. Washington Blvd., Los Angeles 23, Calif., announces the development of "Krink-A-Lac," a remarkable new paint product that has the appearance of a wrinkle finish but does not require heating or baking. It does not require a special gun, and may be used on wood, metal, plastic or even cardboard.

Krink-A-Lac can be applied with

Remember Pearl Essence for

A Decorative Finish

MEARLMAID Pearl Essence is being used on hundreds of different products to produce a decorative and attractive effect.

Investigate the numerous advantages of a Mearlmaid Finish before you select the final coating. Its sales appeal and merchandising value are important.

THE MEARL CORPORATION

153 WAVERLY PLACE NEW YORK, N. Y.

ROSELLE N.J. EASTPORT ME.

Has High Reflective Light Value

For Dials Controls Instruments

WORLD'S LARGEST PRODUCER OF PEARL ESSENCE

any ordinary spray equipment. It requires only 30 to 40-lbs. air pressure at the nozzle and just sufficient feed pressure to blow the lacquer out at the desired rate, with the needle valve of the gun wide open. Krink-A-Lac will air dry in 30 minutes.

Krink-A-Lac is available in 17 bright, beautiful colors, including variations of most standard colors, plus metallic silver and gold. It does not require a filler or primer.

Best results are obtained with Krink-A-Lac by spraying one very wet coat or two ordinary coats in succession with a pressure-feed gun. It does not require thinner unless a suction cup is used, and then up to 25% of thinner may be added.

For added attractiveness and ease of cleaning, a clear lacquer may be sprayed over Krink-A-Lac. Also, novel effects may be obtained by wiping with various colors in oil to produce attractive 2-tone combinations and unique variations, before spraying on the clear gloss or flat lacquer.

Quick-Bake Finishes

Synthetic enamels and clear finishes that bake in a matter of seconds have been developed by Maas & Waldstein Co., Newark, N. J., manufacturers of specialized production finishes.

These new products known as "Flashdur" are designed to help reduce production schedules to a minimum by offering hard, tough, extremely fast baking finishes to manufacturers of metal products such as instruments, compacts, lipstick cases, lighters, cigarette cases, etc. Flashdur is available in clear, black, white and most colors.

Enthone Brass Cleaner

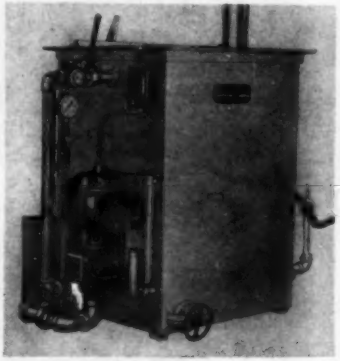
Enthone, Inc., 442 Elm St., New Haven, Conn., has developed a new alkali cleaner called Enthone Brass Cleaner. This cleaner has high detergent ability, but doesn't tarnish copper, brass, bronze, nickel, silver, tin or lead. It can be used as a general cleaner for steel and the metals listed. It has high detergent qualities for soak or electrolytic cleaning. It can also be used for scrub cleaning because it does not contain strong alkalis.

A feature of the cleaner is its long life during operation, due to stable surface active materials and buffered alkali balance.

Spray Type Washer Cleans Metal Parts

A new, spray type washing machine, for quick and thorough washing of parts on racks, is announced by the Optimus Equipment Co., 209 Church St., Matawan, N. J., manufacturer of washing and drying equipment.

This new machine can be placed



Spray type washing machine for handling parts on racks.

Above — Beaver Metropolitan writes: "This coach, Egyptian-finished ten years ago, still in service and never refinished, looks as good today as when it left our shop".

Below — "Our late B-35 PT37 passenger coach. Of course this is also finished with Egyptian Lacquer". Here is pictured proof of Egyptian's enduring quality.

Wisely...

BEAVER METROPOLITAN COACHES RELY ON EGYPTIAN FINISH

In modern transportation long-lasting good looks are an important economy. So is the long lasting protection which high quality finish affords. The eminence of EGYPTIAN finishes in the transportation field—in all fields where finish is important—is eloquent endorsement of the high quality standards which EGYPTIAN steadily has maintained through the years.

We invite your inquiry with regard to any finish problems.

THE EGYPTIAN LACQUER MANUFACTURING COMPANY

SPECIALIZED PRODUCTION FINISHES

P. O. BOX 444, NEWARK, N. J.

directly on the floor; no pit or cement work is necessary. The top of the unit is at working height, and all connections are readily accessible. A lever-operated valve makes starting of the spray easy. Spray nozzles are adjustable and replaceable.

The same machine can be used with submerged agitation to remove caked greases such as Tripoli compound and abrasives.

This machine is designed to eliminate slow and laborious hand-cleaning of small metal parts. It can be used individually, or in series where the washing operation requires several steps; for example, solvent wash, rinse, alkali wash, second rinse.

Flexible Shaft Spindle

The Spring Specialty Co., Maywood, Ill., announces a new direct connected flexible-shaft grinder that rotates 18,000-r.p.m. It is driven by a ¼-hp. motor. The working spindle will take a variety of small tools, including abrasive points, discs and miniature drums; sandpaper wheels, buffing and polishing wheels, etc.

Phosphate Coating Process Before Painting Steel

A 4-page bulletin recently sent out by American Chemical Paint Co., Ambler, Penna., explains and illustrates the features of its Cold Spray-Granodizing which forms, on the steel surface, a non-metallic, zinc phosphate coating of dense crystalline structure, integrated with the parent metal and of uniform texture. This smooth, tenacious bond enhances the adhesion of paint to steel, providing maximum protection with a minimum outlay of paint. At the same time, a high luster is attained and rendered impervious to the effects of time and weather.

This process is entirely automatic and parts can be handled rapidly and continuously in a power spray washer.

Die-Cut Masking Tape

Die-cut masking tapes are popular in a variety of industries, according to the manufacturer, Panoco Masking Tape Division, Paper Novelty Mfg. Co., 505 Carroll St., Brooklyn 15, N. Y.

Panoco masking tape is supplied in any shape or size to meet individual requirements. Its ease of application speeds up production, as it protects and shields surfaces that are not to be coated. The tape is resistant to high temperatures and eliminates costly re-work and touch-up time.

Vacuum Blast Cleaner

The Vacu-Blaster, an entirely new blast-cleaning device that promises to revolutionize methods of cleaning or refinishing metal, is now in production by the Vacu-Blast Co., Inc., 1054 Broadway, Burlingame, Calif.

A remarkable feature of the Vacu-Blaster is its vacuum return system, which permits no abrasives or other particles to escape into the open. Operated in much the same fashion as a simple household vacuum cleaner, the Vacu-Blaster may be used without special precautions or preparations. No marks, goggles, or protective clothing are needed. The vacuum pick-up system is positive in action.

Many types of abrasives may

NEW PERIOD Production Finishes

BAKING ENAMELS LACQUERS SHELLAC ENAMELS FILLERS SEALERS SUPPLIES PRIMERS STAINS SYNTHETICS VARNISHES

REDUCING COSTS

Finishing costs are determined by quantity of production, hours of labor per unit of production and by the methods and materials used. The greatest opportunity for cutting costs is in improved methods of production and in the selection of the right materials that will work efficiently and produce the desired results.

NEW PERIOD LACQUERS and other special type finishes are specially formulated to meet specific production requirements. They are reducing costs for manufacturers because they are easy to apply, dry fast and produce a beautiful finish. The complete NEW PERIOD line includes sealers, gloss, semi-gloss, clear and pigmented lacquers.

Manufacturers who have a finishing production problem or who are interested in better finishes and lower costs are invited to submit their problems to us. You are assured of prompt and efficient service.

NEW PERIOD Production Finishes

NEW YORK WOODFINISHERS' Supply Co.

be used, depending upon the nature of the work to be done and the finish desired. Spent abrasive is reclaimed by the Vacu-Blaster and re-used as long as it remains effective.

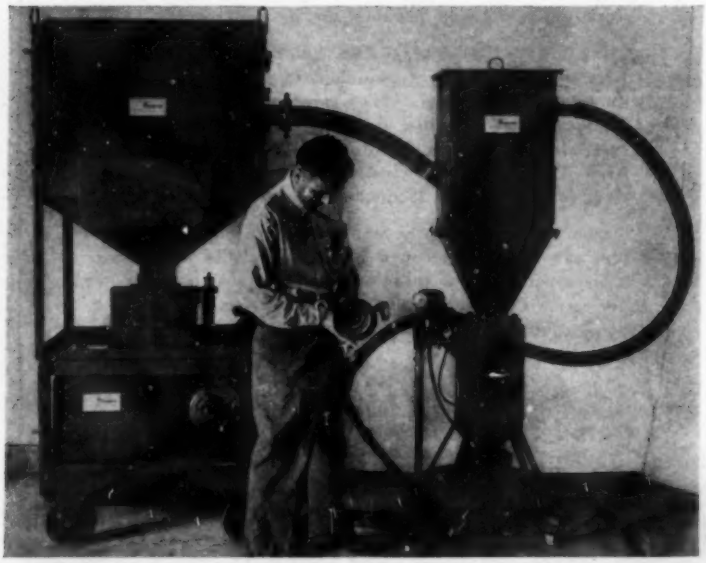
Operation of a Vacu-Blaster is predominantly automatic. The blast is controlled by a switch at the gun through which the abrasive blast is directed and through which grit and dust are picked up. The vacuum system operates continuously returning grit and refuse to the reclaiming tank, where re-usable grit is returned to the blasting system while dust and refuse are shunted off to a dust collector.

Reclaimed abrasive is automatically dumped into the grit-supply tank at the close of each operating cycle. At the same time, the blasting assembly is automatically flushed with clean air to prevent possible clogging. Loading of fresh abrasive into the Vacu-Blaster is easily accomplished by the vacuum system, which picks up the grit through the blasting gun from a container on the floor.

"Rot-Stop" Preserves Wood, Canvas, Rope

Rot-stop, a miracle preservative, is now available for low-cost peacetime use to stop rot of wood, rope, canvas and cloth products, according to an announcement by Rockford Paint Mfg. Co., Rockford, Ill.

Fully tested in all theaters of war, Rot-stop proved its ability to withstand even the intense heat



This blast-cleaning outfit is portable, safe, clean, effective and easy to operate.

It's Tough—tougher than the ordinary lacquers!

Yes, here's a tough piece of goods, a lacquer finish that will meet the most critical requirements of current production. Try it out; give it all the tests necessary to satisfy yourself and you will accept nothing less than this product finish that endures the elements, and the hardships of constant usage. Schaefer's Mar Proof Lacquer is a finish that cannot be marred or scratched. Made in either clear gloss rubbing or satin finish, it produces a splendid transparent coating of full depth on maple, walnut, gum, mahogany and other cabinet woods. Economical; gives plenty of coverage; dries quickly. Our Mar Proof Lacquer Sealer is recommended with it for a first-coater.

A Schaefer Mar Proof Lacquer finish will give you the best start in this most critical period. Use this tough mar proof lacquer, and obtain satisfaction right away. Working samples furnished without obligation. Write for them!

THE SCHAEFER VARNISH COMPANY, INC.
Louisville, Kentucky

THUMB-NAIL IT!

Try to scratch or mar it! Cannot be marred or scratched!

and excessive moisture of jungle areas. The liquid preservative quickly penetrates the fibers of wood, rope, canvas, and cloth, prolongs their life indefinitely as it waterproofs, mildewproofs and protects materials from rot, fungi and termite attacks.

Manufacturers can assure consumers of dependable, longer-lasting products at minimum cost with Rot-stop. Automobile tops for convertibles, fishing nets, ladders, shower curtains, boats, tarpaulins, lawn furniture, and hundreds of other products can be treated economically with Rot-stop. Applied at the factory, Rot-stop will protect these products against mildew and fungi attacks and add years of dependable use to them.

There are two types of Rot-stop: Type "C" is a clear, colorless coating which protects awnings, canvas, wood materials, rope, etc. It may be used as a primer, and may be painted over.

Type "G" is a green-colored coating for surfaces not to be painted. This type is particularly adapted for fence posts, tarpaulins, canvas, netting, rope, shingles, etc.

Rot-stop is easy to apply. It may be brushed, sprayed or dipped and takes but a few minutes to apply.

Eclipse Low Pressure Spray Gun

A new low-pressure spray gun designed for light products-finishing operations, and for use where a limited volume and pressure of air are available, is announced by Eclipse Air Brush Co., 410 Park Ave., Newark 7, N. J.

The Eclipse Junior Model 46 is a lightweight gun that gives remarkable results on very low air consumption. It can be used with

Eclipse's Junior Model 46 spray gun.

both internal and external types of nozzles. Both fluid and air connections are standard ¼-in. pipe. The spray pattern with an external nozzle can be controlled from a cone to a fan by simply adjusting the air valve on the back of the gun.

Eclipse Spray Equipment, Catalog 86, gives complete details of the new Junior Model 46, and other Eclipse low-pressure spray guns for applying all materials.

Industrial Cements Packaged In Collapsible Tubes

A survey reveals that a little cement goes a long way; that unnecessarily large quantities of cement were being used in various assembly operations and that by supplying small tubes of cement, instead of bulk, to the assembly personnel, most of this cement wastage can be eliminated. Accordingly, Maas & Waldstein Co., Newark 2, N.J., manufacturer of specialized production finishes, now packages two of its widely used water-resistant industrial cements in 2-oz. collapsible tubes as well as in larger commercial packages. These cements are General Purpose Cement No. 54 and Spot Cement No. 76.

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A

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  (That Fill)
- **COLORED TONERS**
  (For That Quickly Recognized PLUS)
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  (For Maximum Clarity and Transparency)

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GUARDSMAN STUDIO

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GRAND RAPIDS, MICHIGAN

Makers of the famous Guardsman Finish

Dip-Agitating Machine Cleans Metal Parts

A new dip-agitating machine embodying an extremely simple principle has been developed by the Mabor Co., Box 77, Route 3, Rahway, New Jersey. The drive mechanism, mounted in a removable frame, utilizes only two bearings, and balances the weight of the parts by means of a knee which rests next to the bottom of the equipment, outside of the tank. The drive mechanism does not impose stress on any part of the machine, even when fully loaded, and can be removed, replaced, or just cut off at will.

The Mabor-dip-agitating machine is sturdily built and well designed. It works at great speed, since a machine with a small motor can handle a heavy load or a light load, quickly and easily. Built in many sizes, for wash and rinse, and in special dimensions, it can be heated with steam, gas, oil, or electricity.

The dip-agitating method of cleaning parts is acknowledged to be efficient and inexpensive in many cases where a swishing action gives good cleaning results. It avoids pump difficulties with solutions mixed with dirt, grit, and other impurities.

Patching Wood Surfaces To Be Finished

BY P. C. BARDIN

IN HIGH speed production of wood furniture, cabinets, fixtures, etc., defects in the surfaces are bound to show up and minor damage will occur during fabrication. These places will be discovered during inspection and, of course, they should be repaired in the white, just before finishing.

Various methods and materials are used to patch these defects, depending upon their nature, size and location. Workmen usually learn through experience what is needed in the way of equipment and materials for this work.

The equipment may include a sturdy work bench with vise attached, miter box and saw, a knife trimmer, electric hot plate with combination glue pot and burn-in knife heater, burn-in knives, wood chisels, scraper, spoke-shave, rigid back stencil knives, flexible knife (often the blade of an old hack saw), whetstone; a complete set of clamps, including a dozen or more strong spring type for small piece gluing; felt padded sandblock and suitable moulding sandblocks which may be blocks of felt bandsawed to profile; a low bench or stand covered with burlap or several thicknesses of fiber board on which the piece is placed while being repaired.

Materials necessary for the work are: A good grade of hide glue, assorted sandpaper, various size corner blocks, an assortment of veneer and solid wood of the same species of the pieces to be repaired, stick shellac in assorted colors, and paste crack filler which may be purchased in colors suitable for the species of wood on which it will be used.

Great care must be observed in selecting the correct color of stick shellac to be used for burning-in patches. When in doubt it is better to use a slightly lighter shade than the final color of the piece, because if a lacquer-base stain and filler is used, it will "bite" into the shellac-filled patch and may have a tendency to dark-

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RAYON COTTON WOOL

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Particles finely cut, uniform — fluffy yet filling. ✓

Brilliant colors pastel shades . . . also neutral tones. ✓

Industrial uses include soundproofing insulation surface coatings protective finishes, etc. ✓

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Details, samples and prices upon inquiry ✓

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When coated with Claremont Flock, gift and display cases such as that shown above, provide product enhancement . . . stimulate increased sales. Functionally, flock-treated interiors protect contents from marring—tend to "cushion" the merchandise.

With numerous product advantages and various industrial uses, Claremont as the country's largest manufacturer of flock, stands ready to serve your requirements. Prices and samples upon inquiry.

CLAREMONT WASTE MANUFACTURING CO.
CLAREMONT, NEW HAMPSHIRE
The Country's Largest Manufacturers of Flock

en the patch. If the patch shows too light in color after the final coat is applied, it will be much easier for the varnish patcher to blend the patch to a darker color than to a lighter shade. After making the patch, the shellac may be immediately chilled by pressing a wood chisel on it, whereupon it may be shaved down to a smooth surface and sanded. Shellac patches should never be made on corners. It is better to glue a veneer or solid wood patch on such places.

At least three different types of crack filler are on the market. These include wood flour mixed with a binder, the "water putty" type, and the same type of filler using naphtha as a softener. Practically all crack fillers will take stain. However they should be purchased for the particular specie of wood in which they will be used. Wood flour filler has a tendency to shrink when it dries, so if the crack is narrow and rather deep, it is better to fill it half way and allow this to dry; then fill the remainder to a slightly high surface level. After drying it can be cut down flush with the surface by using a chisel and following up with sanding.

The "water putty" type of crack filler is probably the fastest material for repairing cracks, nail hole sets and deep scratches. It can be worked down into the crack with a flexible knife blade, and since the solvent is water, the application of a hot burn-in knife affords forced drying. When the filled crack is dry, the patch may be sanded immediately, using No. 2/0 or 3/0 sandpaper, and the piece is ready for finishing. Also, this type of filler has little tendency to shrink.

As a rule the patcher keeps crack filler in the original container with the lid pressed tightly in place. He puts a small quantity of filler in a shallow can or lid on top of his bench, for use while he works. Exposed to the air, it will dry to the point where it becomes crumbly, hence it is necessary to occasionally add a drop or two of water, or naphtha, depending upon the type of filler being used.

Crack fillers, as well as stick shellacs, are excellent repair materials, and offer permanent and satisfactory results when used in their proper places. However, it must not be assumed that every defect, regardless of size, depth, and location can be repaired with these materials. Sometimes a slight bruise made by pressure can be repaired by "raising" the grain of the wood with moisture, then applying a hot iron and sanding. It is only through long, practical experience that a patcher can quickly determine which method and what material to use for permanent, satisfactory results.

Maas & Waldstein Co. Buys Smith-Davis Paint Co.

Maas & Waldstein Co., Newark, N. J., manufacturer of specialized production finishes, announces the acquisition of the Smith-Davis Paint Co., 10751 Venice Boulevard, Los Angeles 34, Calif.

That company, established in 1923, will continue to manufacture industrial finishes, trade sales and maintenance sales paints. In addition, the company's retail store for consumer paint sales will be modernized and enlarged as soon as building materials are available.

C. R. Parry, Pacific Coast Divisional Manager for many years with M. & W. will supervise the new plant and will move his present office and the company's warehouse to the Venice Boulevard address.

The field activities will be carried on by combining the sales forces of both organizations, and other personnel will be added at a later date.

Booklets Catalogs Circulars

Catalogue of Finishers' Supplies

A 20-page catalog of supplies for wood finishers and refinishers is being distributed by H. Behlen & Bro., Inc., 10 Christopher St., New York 14, N. Y. Alphabetically, the supplies listed range from Anilines to Waxes.

Water Wash Compounds

Binks Mfg. Co., 3140 Carroll Ave., Chicago 12, Ill., is prepared to furnish users of water wash spray booths with several different kinds of excellent water wash compounds for conditioning the water in spray-booths. The compound is sent out in 25-lb. containers or 400-lb. steel drums.

A bulletin listing some of the different water wash compounds—also paint stripper and spray booth coating—will be sent free on request.

Rust-Oleum Issues New Catalog for 1946-'47

Rust-Oleum Corp., 2425 Oakton St., Evanston, Ill., has recently issued a new descriptive catalog "Rust-Oleum Stops And Prevents Rust" outlining the qualities of the company's war-seasoned rust preventive products for industrial, railroad, marine, farm and general uses.

The catalog, produced under the direction of Robert A. Fergusson, Rust-Oleum president, analyses the rust preventive requirements of each of these broad fields, with complete descriptive data on uses, applications and engineering specifications of Rust-Oleum. Problems of scientific rust control, together with directions for use and application of Rust-Oleum are given in the catalog's first section.

Specifications, listed in the catalog's second section, are organized for easy reference through the use of 39 color cards, augmented by 12 color panels of machinery and implement finishes. These cards show the various colors in which Rust-Oleum is obtainable.

The catalog's third section outlines recommendations and the inside back cover contains a handy index of products in the new postwar line.

Fire-Extinguishing "Mearlfoam"

A 4-page, 2-color bulletin reveals quick practical facts about "Mearlfoam"—what it is, how it performs, where it is used, and what equipment is needed. "Mearlfoam" is an excellent medium for quickly putting out all kinds of finishing room fires. For a free copy, write to The Mearl Corp., 153 Waverly Pl., New York 15, N. Y.

Book on Violin Varnish Reveals Lost Art

A new book on the subject "Violin Varnish," by Joseph Michelman, reveals interesting, practical and authoritative information on this subject. The author gives many references to the works of other writers. His book is very easy to read.

The book is based on eight years of research to discover the "lost secret" of the old Italian violin varnish that was used by Stradivarius, the Amati, the Guarneri, etc. Convincing evidence is presented to show that the rediscovery has now been realized.

The varnish used by the old Italian violin makers may be of interest to modern paint and varnish technologists because it was also used by medieval painters and varnishers. Then too, the varnish possesses interesting properties (permanence, for example), so its adoption in some modern form would be logical.

However, especially of interest are the color resins described in the book. These resins may be produced in all the colors of the spectrum; they are relatively permanent and deposit perfectly transparent film from a variety of solvents. Resins of this type have not been available before. They are made from inexpensive and plentiful raw materials by very simple methods. It is predicted that these color resins will find much more use in modern decorative and protective finishes and in plastics than in violin varnishes. A modern lacquer in which one of these color resins is used is described in the book.

The book contains nearly 200 pages 5 ½x8 ¼ inches in size, and is divided into 18 chapters. It has an alphabetical index of words and subjects and is bound in stiff red covers lettered in gold. Price of the book is $3.75. It is published by the author, Joseph Michelman, 5050 Oberlin Blvd., Cincinnati, Ohio.

Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metal-working, woodworking and miscellaneous industrial plants where production cleaning and finishing are major operations in parts and products manufacture.

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Editorial

Plan Sales Program And Train Salesmen

Because of present day conditions, selling merchandise has joined the ranks of lost arts. In the retail trade especially, so-called sales people are placed behind counters, evidently without training or instruction, without knowledge of the product, and apparently without ambition to learn.

Many wholesalers and manufacturers have allowed their sales force to disintegrate during the past five years for the obvious reason that regular salesmen were not needed to secure Government contracts. Production has not gained sufficient momentum to cause management to become sales conscious.

As a result the words, "No sales program contemplated," and "Salesmen not needed," are echoing all along the line. If present day conditions would continue indefinitely, such an attitude might be satisfactory. But these conditions will not continue. If anyone could foretell the month and year when the transition back to a buyers' market will be completed, sales programs and salesmen's training courses could be properly timed for the event. Accurate prognostication, however, is impossible.

So it would seem to be logical common sense to use the present time for going ahead with a well planned sales program and an intensive sales training course for both old and new salesmen. Old salesmen are out of practice. They have had a lot of extraneous things on their minds during the past several years. Changes have been made in buyer personnel; salesmen have gotten into the rut of making excuses for their companies' lack of merchandise; have been lulled into the very comfortable but false position of being able to hide behind a thousand good excuses for not delivering merchandise on time. In many cases, they have absorbed the "don't care" attitude that prevails all about them. Training new salesmen will be more difficult, for they will easily

acquire all of the negative attributes, plus lack of knowledge of buyers and the products which they will be called upon to sell.

Yes, management has a big job on its hands—and a costly one too. First there is the problem of finding the right man, in or out of the organization, who has sufficient knowledge, imagination and initiative to undertake the task of planning a program and instructing new salesmen. Second, to find the right type of intelligent, alert, and ambitious people to join a sales force which is still in the blueprint stage. No immediate return on the investment is possible, but the reward will be to those who are far sighted.

Fundamentally selling will never change, but in the coming era of intensive competition, new products will call for new techniques. New methods and materials will require greater and more specific knowledge of the product. Time to make plans and train men is now.

Which Cleaning Material To Use For The Job

★ The above question frequently poses a perplexing problem in many finishing departments and shops. What to do in such cases? Does it have you stumped?

If past experience fails to furnish the answer, the next best thing to do, if you want to get

★ Guest Editorial . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

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H. R. Simonds' revised book

FINISHING METAL PRODUCTS

352 pages, 6x9, illustrated, $4.00

BESIDES fully describing modern shop technique, this book coordinates metal finishing processes and finishing problems with the over-all problem of manufacture. The usual types of finish, such as galvanizing, polishing, plating, lacquering, and painting are thoroughly treated, as well as many new finishes of a specialized nature. An important feature of the book is the section on cleaning and descaling. Throughout, both technical and commercial aspects are considered in detail in an endeavor to point the way to more attractive metal finishes and to more efficient means of producing them.

Industrial Finishing

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practical aid in finding the correct solution to your particular problem, is to consult your cleaning materials supplier. By availing yourself of the facilities of his technical laboratory staff and field service organization, you get suggestions based on intimate, specialized knowledge of cleaning materials and methods, coupled with on-the-job experience.

Here is an unbeatable combination that can save you a lot of time, money and effort when it comes to deciding which cleaning material to use for that job!

These technical specialists and service representatives w r e s t l e with cleaning problems of every description day-in and day-out. Tackling a tough degreasing task is their meat and drink, for they are vitally interested in helping you get what you want — better cleaning at lower cost. Since you both have a mutual interest, it's just a case of downright "good business" all around for you to take advantage of the practical, helpful advisory service that any reputable cleaning materials manufacturer offers.—ROY SMITH.

Competition Coming Back With a Bang!

★ Indications continue to pile up with snowballing speed on all fronts that competition is coming back into its own with a big bang, now that the first floodtide of long-scarce goods is receding and the overall supply picture begins to approach a more normal focus.

A salient summary of current conditions in the nation's number one metropolis, for example, vividly portraying the present situation there, appears in a recent issue of

"National Affairs," bulletin of the National Advertising Agency network. Because it offers food for thought for many industrial finishers, an excerpt follows:

"There is the first fluttering of failures among business enterprises newly founded by veterans. Sales of some magazines are slipping. Truck tires sell at a discount in some cities. New radio sets made by unknown, untried producers go begging in a few New York City stores. Some veterans can't find jobs needed to support expanding families. Out-of-town department store buyers are becoming choosey about merchandise. Radio advertising has slumped; advertising agencies are firing people. A Philadelphia dealer in electric hot water heaters had 1,500 'orders' on his books, but had to call 500 of these people to dispose of the first 35 heaters delivered to him."

A meaningful moral for many manufacturers here! What does it all mean? Briefly, just this:

There's tougher sledding ahead on the road to sales. "Easy come, easy go" in merchandising is disappearing fast, and to offset this, markets must be widened and more goods must be made for more people at lower prices.

Finer finishing at lower cost is one of the first steps in this general direction. Any time-saving, cost-cutting opportunities that give heartening promise of increasing output and decreasing unit costs in product-coating operations should be examined and re-examined intently. The old saw, "a word to the wise is sufficient," is still applicable to modern industrial finishing.—L. Romer.

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Flying Start to A Flawless Finish

★ What is the best way to put a flawless finish off to a "flying start"? This is always an intriguing $64.00 question to finishing department superintendents and shop foremen who are eager to jack up their product-coating operations to a superior standard of quality. Today, in view of the steadily growing insistence for better finished work, it commands even greater interest and importance.

This challenging query is not always the simplest in the world to answer. Obviously, the answer depends on multiple variables, for instance: Type, shape and size of the article to be coated; the particular finishing process employed, and suitability of materials used; purpose for which the product is to serve, or the service conditions it must meet; kind of surface preparation followed, and thoroughness with which it is carried out; degree of soil removal achieved and maintained. All of these and other inter-related factors have a direct or indirect influence on consistently producing a good-gripping, long-lasting, wear-resistant surface finish.

Based on long-accumulated experience of countless factories, particularly those that have an enviable reputation for "super" finished work, one of the surest clews to the right answer may be found at the very start of the product-finishing cycle—the initial step in the production routine upon which succeeding steps depend so heavily.

First, of course, is thorough cleaning or degreasing. Though this requisite has been emphasized

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25 S. Hancock St., Indianapolis 8, Ind.

repeatedly by writers in this magazine, it will continue to merit special editorial attention in the months and years ahead. It is so necessary to efficient economical finishing that too much emphasis cannot be placed on it.

Effective surface preparation, absolutely essential though it is, need not offer a complex problem today. This key production operation can be put on a speedy precision basis. It is being done in plant after plant where this basic operation receives the meticulous attention and exacting study that it so justly deserves. Herein it is often the "secret key" to flawless finishing. Yet there is no plausible reason why it should be shrouded in a thick veil of mystery, as has been the case on more than one occasion.

Today specialized equipment, techniques and detergents are readily available; and used in the proper combination, they turn in a bang-up job. Informative data and constructive assistance are gladly furnished to finishers by all reputable manufacturers — and such valuable help is yours without any extra expense.

If you are not getting the flawless finish you want, due to incomplete or improper removal of surface contaminates from the work, don't handicap yourself any longer by putting up with haphazard results or makeshift expedients. Instead, consult your cleaning equipment manufacturer or materials supplier. Get his suggestions. Invite him into your plant to make a survey or analysis of your particular degreasing and cleaning requirements from stem to stern; then put his ideas, suggestions or recommendations to work without delay.

This, in the long run, is the quickest, easiest and best way to get the flawless finish you want.—S. J. TREZAC

During the past 21 years there has been a 350% increase in the number of battery-powered industrial trucks in use in American industry.

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Get Along Better With Workers

★ How to keep peace and contentment in the finishing room is more of a problem that falls on the shoulders of the foreman finisher. It is part of his regular job and not a special project. A finishing foreman who has the ability to "know his men" is an asset to any company. He is the one person in position to know their likes, their dislikes, and their various ways of conduct under different conditions.

A courageous executive with a sympathetic ear to his employees is the means by which bad feeling and labor trouble can be kept to a minimum. Remember, it is not only the almighty dollar that causes walkouts or strikes. More likely it is the lack of understanding human nature on the part of some department head.

Modern industry cannot afford to overlook the study of ways and means to give a sympathetic ear to the legitimate needs of its workmen. Because of the low profit per item, today's industrialist can make money only through efficiency—efficiency of his men who operate the machines; efficiency through increased production. You oil your machines that run regularly. Do you oil the men that run the machines, with the same care?—N.A.

Skin trouble, caused by contact with solvents or oils, can be avoided by wearing flexible transparent gloves or other garments made of compar, a product of Resistoflex, Corp.